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ABSTRACT

This collection of scenarios of the communication futures in Hawaii was produced by the Hawaii Communication Future project as part of an ongoing attempt to bring about the greater awareness of potential communication problems and possibilities for the people of Hawaii. It begins with a discussion of guidelines for writing scenarios of the future including relevance, usefulness, originality, consistency, and communicability. Topics of the 12 scenarios include: A communication futures game for Hawaii, electronic multicultural exchange enhancement, A 2020 Vision of Communication in Hawaii, and Program No. CZ 17403. The report concludes with a section dealing with communication policy and planning issues. (TJ)

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SCENARIOS ON HAWAII'S COMMUNICATION FUTURES:

Round One

Edited by

L. S. Harms and Richard J. Barber

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PREFACE

The Hawaii Communication Futures project is an ongoing attempt (coordinated through the Hawaii Research Center for Futures Study of the Social Science Research Institute, University of Hawaii, Manoa) to bring about greater awareness of potential communication problems and possibilities for the people of Hawaii. The scenarios reprinted in this document represent one of several related project activities which have included day-long meetings, a number of shorter seminars, and the issuance of a number of informal reports.

As indicated in the "scenario for the scenarios" at the end of this document, we see all of the activities as being loosely related and cumulative. Hopefully the materials in this document will serve as building blocks or at least as catalysts for additional participation and sharing of ideas and information.

The Hawaii Communication Futures project has been supported by a large number of small contributions from the participants themselves, a few larger contributions specifically for the scenario awards and a contribution from the Hawaii Society of Corporate Planners to underwrite the cost of this publication. This type of broad-based support is in keeping with our aim of involving a large and diverse group of individuals. As of this time there are more than 220 people on the mailing list -- all of whom have participated in at least one of the HCF sessions.

We hope you will join with us in the next round of activities.

I PROLOG

The materials in this section were used to initiate the scenario activity, and were first made public on May 11, 1977 as part of a conference on Hawaii's Communication Futures.

Because scenario preparation is first and foremost a creative activity, Lew Walkup discussed the happy conditions that surround creative activities of many kinds. He suggests that inventors ought to be "in a playful mood," "curious," "more interested in what they don't know than what they do know," but most of all it is necessary to "THINK." Walkup is a retired researcher and inventor who now makes his home in Honolulu.

"There is, of course, no single correct way to write a scenario of a future society." Jim Dator used these words to open his discussion of the techniques of the kinds of creativity required for scenario development. He suggests that the scenario creator know about trends, events, and what people "think the future is going to be like." He discusses few types of scenarios: future history, looking backwards, slices of the future and choice and consequences. Dator is one of the most active members of the "futures community" in Hawaii.

The guidelines used by the scenario writers were developed by Dick Barber, Stan Harms and Dallas Williams. They stress the need to be creative and the wide variety of appropriate formats for scenarios. The five criteria for excellence of the scenarios were: relevance, usefulness, originality, consistency, and communicability.

ON BEING CREATIVE

Lewis Walkup

Each one of us is capable of being quite creative in our daily lives; this skill is not a God-given boon, rather it is one of many "skilled performances" that can be learned in much the same way that one learns to play golf or to type rapidly.

Creativity is very much needed in our modern culture. In fact, I think that in communication there are tremendous needs for creativity; not so much in the hardware of communication as in the software. We have perfectly good ball-point pens, pencils, and typewriters yet many people cannot write intelligible letters. We don't have the software to use much of our hardware!

First some odd facts about creativity: It doesn't grow very well in large corporations, surprisingly; it seems to do better in small organizations. Creativity seems to be motivated differently from other activities. For example, IBM once conducted some experiments in which various groups of students were asked to solve problems that required a bit of creativity. Some groups were offered twenty-five dollars if they got the answer in a few minutes. The other groups were told that they faced an interesting problem. Now, which group do you suppose got the answers first? It was not those offered the twenty-five dollars! They wanted the money so badly that they wouldn't let themselves be really creative. They wouldn't let themselves consider novel and bizarre solutions to the problem.

America hasn't been a very good climate for creativity. Many of our important developments came to us from Europe. You probably know that practically all of the basic science behind nuclear energy was developed in Europe. In fact, we had to import many of the scientists who carried it forward in this country. Even today, the Swiss, British and Scandinavians take out more patents per capita than we do. A recent survey showed that forty-eight of fifty new and promising drugs came from Europe rather than from America. We are very practically minded and great appliers, but not the best of creators.

Creativity is like a joker in a deck of cards. It lets you do unusual and unpredictable things. For example, Xerox Corporation's stock went from 1 to 1000 because of creative ideas, not primarily because of good accounting practices, good manufacturing, or good sales efforts though, of course, these things contributed to success.

What is creativity? I have tried to put in a few words by saying: Creativity is the production of significantly new concepts by the ingenious working of the human intellect.

To be creative, concepts have to be new, they have to be significant, and not obvious; just putting together a series of nonsense words isn't creative. In other words, if you gave the same problem to fifty engineers and they all came up with the same answer, the process didn't involve creativity. Creativity has another peculiar property: usually when one person comes up with a creative idea, everyone else working on the problem yells "foul!" because usually the creative person didn't solve the problem that the other workers thought they had to solve.

Let us suppose that we are running a soap company and we want to make soap chips. We have all of our creative people trying to figure out how to dry these soap chips. Now, someone comes up with the creative idea that we sell and advertise the virtues of wet soap. This may solve our practical problem but everybody else would yell "foul!" because they would feel cheated. In fact, creativity does have a great deal of cheating in it. You're trying to cheat Nature or someone else in the same field.

It is possible that there could be as many ways to create new things as there are individuals doing the creating. But, this does not seem to be the case. Studies on the subject, certainly in the fields of science and technology, reveal that virtually all creative persons follow a common pattern, which goes something like this:

1. A problem is recognized or a state of things is visualized that cannot be achieved by known methods. This problem is "adopted" by the individual; it becomes a part, almost an obsession with him.

2. The individual explores all of the knowledge he can find in the area of the problem. The problem usually is in his own field so that he is well equipped to think about it anyway but, sometimes, it may involve his educating himself in some unfamiliar fields.

3. During and after this collecting of knowledge, the individual spends inordinate amounts of time thinking about the problem. When asked how he arrived at the theory of gravity, Newton is supposed to have replied, "By thinking about it all the time," or words to that effect. Many great creators have testified to this almost obsessional involvement with problems.

4. Frequently there follows a period of "tantilization" in which nothing seems to be happening in one's mind, but the problem does spring up to consciousness from time to time.

5. Finally, there occurs the "flash of insight" in which, seemingly from nowhere, the answer to the problem or the way to reach the desired goal comes vividly to mind.

And, this is all there is to it, in its bare essentiality. But, of course, one could describe playing tennis in equally simple terms. In creativity, as in tennis and in many other skilled performances, many factors enter into one's skill in playing the game, including a great deal of practice if one is to develop really great skill in the activity.

Let's look at the elements which seem to be involved in all creative activity. One of them is a modicum of mental ability. Evidence suggests that individuals with valid IQs below 100 simply don't create very much. Creativity seems to rise rapidly to an IQ of 120 or so and then gradually slope off above that level. People with extremely high IQs, as measured conventionally, don't seem to be as creative as people with somewhat more modest IQs. To be creative in a field you must have knowledge in that field. You can't be very creative in someone else's field. I wouldn't try to be creative in the field of brain surgery; I don't know anything about that field. I try to stress to University students that in acquiring knowledge they are getting the stuff they're going to use in their future creativity.

It helps to be intellectually oriented. Creativity takes place in the human intellect. If you are going to do much of it, you are going to have to use your brain a lot in the "thinking mode." And, if you are going to do this, you've got to like such activity.

I've found that being in a playful mood helps creativity. Playing with bizarre ideas helps a lot. Creativity is not done seriously. It does involve a sort of dissatisfaction, but I hasten to add that this is not the destructive dissatisfaction rampant in our country today. Rather, it's dissatisfaction that says, in effect, there ought to be a better way to do this or that and I think I can figure out how to do it.

You have to be able to visualize or hallucinate situations to be creative. The creative people that I know are great visualizers. To demonstrate what I mean here, let me give you just one little example: think, each of you, of a cube made up of twenty-seven cubes stacked up. Now, let's paint the large cube a different color. Let's say if it was white, we'll paint it red. How many of the smaller cubes did we paint on one and only one side? How many on two and only two sides? Some people can't visualize such a cube at all; others can visualize it with great clarity.

Let me now go over briefly the characteristics of creative people. They're curious. They spend more time

attending to what they don't know than to what they do know. As I said earlier, they have average IQs, or higher. Their knowledge is good but not necessarily spectacular. Frequently they're generalists; unlike specialists they cover many fields. They're lone wolves--solo actors in general. Creativity is note done by committees--it's done by individuals. They're dissatisfied with things as they are. They are not authoritarians, hence, they may be difficult for management to work with.

Now, after this brief introduction, let me do the perhaps brash thing of instructing you personally on how to go about being creative:

In the first place, as stated above, scientific creativity is intellectual activity. Hence, anyone attempting it should be able and willing to use his intellectual activity to its full capacity. It helps if you actually enjoy intellectual activity--as not all people do, even some who are functioning in intellectual fields! Next, it is important to convince yourself that this sort of intellectual activity is the most important thing that you could be doing with your time. If you are successful in this, you will have no feelings of guilt because you are not springing into action and doing obvious things about your problem, like holding conferences, gathering data, doing experiments, or writing proposals or reports.

Next, you must put yourself into so leisurely a frame of mind that you will gladly entertain almost any thought that comes into your mind about your problem. Admittedly, this is difficult to do in the usual environment of ringing telephones and gregarious colleagues but, easy or not, you must do it. You may want to experiment with different locations conducive to your own creativity. Isolating yourself in some unfamiliar place may help, or you may find that you create out in the park, at the beach, in a crowded library reading room, or even in a church service! In any case, you will benefit by getting away from your usual contacts with other people. Also, find the time of day when you are most creative. This may be any time from early morning until late at night.

The next step is relatively simple: Provide yourself with pencils and plenty of clear paper, perhaps a small calculator or slide rule, and a few books pertinent to the fields involved in your problem.

Now comes the most important part of the process: THINK, THINK, THINK, THINK!! Free associate as a psychologist might call it. (Genuine "thinking" is rarer and more difficult than one might suspect. Most of what we do with our brains is really in what might be called the "storage-and-

retrieval" mode. In really "thinking" about a situation, one must question and verify everything that he hears and knows about a subject; he doubts almost everything that he knows about it; and he tries to view everything from all possible points of view. In real "thinking" one tries to ferret out the essentials behind the obvious facts--and to explore all of their implications. And, while not easy, such use of the brain is stimulating, rewarding, and just a lot of fun!)

During these sessions of thinking about your problem be sure to write down almost everything that occurs to you about your problem. In this way, you will not be required to develop every idea as it occurs to you, but can move on to hopefully more fertile grounds with the assurance that the ideas you do have are not lost to you--as they very well may be if you don't write them down! Perhaps what you will be doing at this stage is best described as "playing with" the problem. In doing this, you will want to think about your problem from every conceivable angle and as it depends on all sorts of related effects. The discovery of the benzene ring is reported to have followed just such a dreamy visualization of possible arrangements of carbon atoms in chains. You may want to act out whole processes or even factories in your imagination, and see how they work. Max Planck has pointed out, "Again and again the imaginary plan on which one attempts to build up order breaks down and then we must try another. Thus imaginative vision and faith in the ultimate success are indispensible. The pure rationalist has no place here."

You will find yourself writing down all sorts of things. For example, you may want to state your problem in a variety of ways, or decide what you would do with certain data, if you had them. You may make approximate calculations of orders of magnitude of effects that you have thought of--but don't let such calculations get out of hand or distract your attention from your main concern with getting new ideas. You probably will want to list all possible theories concerning the solutions you think of; inventions relating to the problem; questions to which you would like to have answers; and a wide variety of physical effects that might be involved; to mention only a few.

You will find it helpful to make lists of all sorts of parameters that bear on your problem. Suppose you are trying to devise a method for getting the general Public involved in some specific activity. You might make lists of such things as (1) all human senses and appetites that might be appealed to (2) all of the ways in which the Public has been approached in the past, as in all forms of advertising (3) all of the things that you can think of that might be preventing the Public from engaging in the activity that you are promoting

(4) all the excuses that individuals might use for not following your suggestions, and ways for overcoming each excuse, and (5) the many, even wild, things that you might do to reach and influence the Public with your message.

One pitfall must be avoided at this point: it is quite possible that you will come across one or more ideas that look so good that you are tempted to stop the whole process and dash out to try them out. Resist that impulse! Remember that your brilliant idea is recorded so that it will not be lost, and that it will be just as good a week from now. And, more importantly, the ideas that are still in your brain may be much better.

At various points in your musings you may want to refer briefly to the literature on the subject and to search out what others have done in the field. This is fine. But, avoid making any literature searches worthy of the name at this point; they can throw you quite off the track of the creativity that you have started. You may want to read over your notes from time to time, perhaps combining them in different ways or discussing them with others who understand and are in sympathy with your method of attack on the problem. Generally, however, you will learn not to expect too much from such conferences.

Finally, you will want to arrange your notes and other materials into a somewhat orderly whole. In so doing you may find, perhaps to your surprise, that you have a very systematic plan that can be followed in future work and that you have come up with far more material things than you ever thought resided in your brain!

Your first analysis, no matter how good it appears, is not the end of such activities. Further experience and new facts may change the situation entirely and may necessitate, or give you the opportunity, to start the whole process over again.

One final observation about intellectual activity of the creative sort: it is one of the most trying and exacting things that a human being can do. Consequently, although you may enjoy having completed such activity, you may find yourself avoiding it by all sorts of ruses. It is, nevertheless, tremendously rewarding to those who discover and gain still in this area.

ON INVENTING COMMUNICATION FUTURES

James A. Dator

Techniques of Scenario Development

There is, of course, no single, correct way to write a scenario of a future society. You have some hints, as well as specific criteria for evaluation, given in the "Hawaii Communication Futures Scenarios: 1977-2020" paper coordinated by Dallas Williams. I would like, however, to add some things from my own experience in scenario writing that might be of some help to you.

First of all, if you're going to write a scenario covering the next 43 years of whatever time span it is, you need to have some information about the future. You need to know what the constraints on the future are going to be. Now where do you get such information? I teach courses at the University of Hawaii on that, and I would strongly recommend you sign up for those courses. I'll tell you everything you need to know about how to look into the future! If perhaps you don't want to do that, or have taken the courses already and realize that I know nothing about the future, then let me suggest very briefly that there are three sorts of things you need to look at in order to know what the constraints on the future might be.

The first might be called trends--these are forces from the past and the present that are pushing society in certain directions. These trends may be factors of population growth, energy development or depletion, technological change and the like. One of the things you need to do is to decide what are the significant factors in the present and the past that you need to consider, and how might they grow or cease to grow in the future.

The second thing is a consideration of events. Now "events" I take to be fundamentally different from "trends." They are the things that interrupt the trends; they are the unpredictable elements of the future. I would suspect that if you don't like where the trends are going, one of the things that you're going to do in your scenarios is to bring in a couple of events that are going to disrupt the trends in ways that are favorable to your point of view. These could be political decisions; they could be so-called acts of God; they could be trends that are hidden and that "suddenly" become dominant a little later.

To me, however, the most important thing, the thing that I personally spend most of my time looking at, is what I call images. Images of the future are what people think the future is going to be like. I find that peoples' images of the future often determine how people act at the present time. The actions of individuals today, and in each successive day, are in fact the major shapers of the future. You might ask yourself "what are the various ideas about the future held by people in Hawaiian society today? What sort of future is imagined by individuals overtly involved in shaping Hawaii's future?" It is my belief that all of these different images, and the actions that flow from them are among the major shapers of the future.

In fact, because there are significantly different images of the future in peoples' minds, and in the minds of different groups of people in society, I find it impossible to talk about the future. Long ago, I gave up the idea of attempting to predict the future. Rather, I became more interested in trying to find out what might be called the alternative futures. That is, time from the present is, in a sense, like a tree. The trunk of the tree is the present and time flows out in branches becoming evermore indefinite and evermore branching away from the solidarity and certainty of the present. The best that I can do, and the best I suspect any of us can do, is to determine what the major alternative futures might be, and plan for these alternatives, rather than for any one of them.

So the second thing I would ask you to do in developing your scenarios is to indicate what the major alternative futures from the present might be and to develop some scenario or sets of scenarios for each of these major alternative futures. Certainly, if you're making policy, telecommunication or any other type of policy, you don't want to bet your life on a used future. You don't want to say, "well, I guess this is what the future is going to be and here's my policy for it." I think one of the biggest creative needs presently is in the area of policy-making. In legislative decision-making, for instance, we should identify and then make policy for alternative futures rather than betting everything on the outcome of a single future, as we do now.

I won't go into the various types of alternative futures that I have uncovered. I leave that up to you as a homework assignment to come up with your own alternatives. But let me warn you that if you are relatively new at this business, it's going to be one of the most difficult things for you to do. Because we are all so poorly trained in thinking about alternative futures, in fact thinking about futures at all, when we do begin to think ahead, we tend to be very dwarfed in our images. We don't think very far ahead.

We don't think very expansively. And then when we do begin thinking about a future, we lock into it so tightly that we can't imagine any alternatives. Thinking in, and planning for, truly alternative ways is, I think, absolutely necessary, although I know from my own experience it's very difficult.

Certainly, the two dominant conflicting images of the future of our post-industrial society today are those of continued growth and development versus some sort of conserver society or steady-state or ecological society. I think we can expect this to be a major conflict in the evolving future of Hawaii and in most of the industrialized world. I find that the developers and the environmentalists, if I may use those terms, see the future quite differently. Oftentimes, the two groups cannot believe the other has any grasp of reality whatsoever. Talk to any of the developers and they'll say the environmentalists are absolutely insane. Talk to any of the environmentalists and they'll say the same about the developers. They're each totally locked into their own image of the future. And there are many others, holding different images, who are equally locked into theirs.

Let me make a comment or two about the various types of scenarios. I would like to suggest that you consider, if it's appropriate with the ground rules, four different types of scenario writing. The one that I call Future History takes a form similar to a very famous scenario written by Paul Erlich several years ago, and first published in Ramparts magazine. The opening sentence of that scenario was--"the oceans died in the summer of 1979." Perhaps some of you saw it. The opening line was on the cover of the magazine which showed a dried-up ocean bed. And then you turned to inside pages for an unfolding of events from about 1973 to 1979. Erlich began with real events that had occurred in the late '60s and early '70s, described a number of choices facing decision-makers in the '70s, and then proceeded to show how a group of wrong decisions were made, thus leading to the so-called "death of the oceans" in 1979. Now this is what I call a "future history." It involves taking real events in the past, decisions in the present, showing how those decisions might be made, and then working out a plausible set of consequences.

A second type of scenario I call Looking Backwards. This obviously comes from the very famous book by Bellamy called Looking Backwards in which you somehow are transported into the future where there is a child who asks his daddy how the world ever got to be the way it is. Or you may have a Rip Van Winkle--a person who suddenly wakes up in the future and has to have it all explained to him. Teg's 1994, written by Robert Theobald, is also an example of a "looking backwards" type of scenario effectively done.

There is another way of "looking backwards" that I have found to be extremely exciting, and that takes the form of parliamentary debates--legislative debates in which you have a series of speeches, set in the year 200, 2020, or whatever, discussing various acts that resulted in our being where we are "now." This allows the opposition party to say--"no that isn't right at all; and if we had been victorious then that would never have happened." You can get varying interpretations of how we got to the "future-present" by using this approach to scenario writing. The parliamentary debate technique I've seen work quite well in arguing energy policy in Canada: two alternative scenarios, one relying very heavily upon nuclear fusion power generation, the other upon solar power, were argued as though in Parliament from the point of view of future data. The contrasting scenarios indicated what the future would have been like if we had made one, rather than the other set of energy decisions. You might want to do something like that in your telecommunication scenario. Real debates in legislatures often spend a lot of time telling you why you are where you are now, and why you've done what you've done. Thus, it is a relatively believable form of "Looking Backwards."

The third technique I would like to recommend to you I call Slices from a Futures Fruit Cake. Very common to science fiction writing, it is a technique whereby you are --suddenly--somewhere else. You're not in the reality of 1977, and it is never explained how you got to be where you are in the way that "looking backward" does. You are simply transported to a different place and like a child you probe around in the environment, and suddenly things begin to make sense. The best science fiction writing has this form: you are frequently mislead for a major portion of the writing, but later find out that things that have certain meanings in 1977 have totally different meanings in the year 2020.

I would urge you to consider doing a "slice of a futures fruitcake" for a variety of alternative futures. If the future branches like a tree, then you can go up one branch, slice it at a particular point, and describe what life will be like having taken this direction. Because you are suddenly transported in time by this technique, you discover that people behave quite differently in the year 2020. If you incrementally move towards the future, which is the way we are told life tends to evolve, then you don't really notice how profound the differences are. But if you suddenly jump into the future, try to look around and make sense of it, and do this with several different alternatives, I think then you can see the real importance of making planned policy choices. And that, in fact, gets me to the fourth technique I recommend you consider.

I call it Choice and Consequence. It's a technique that was most popularly developed at the 1967 Expo demonstration at the Czech pavillion. Any of you who went or heard about it know that a film is played, a problem is presented, the lights come up, and you are asked to vote on one of four alternatives. The audience is polled by punching a little button, and then on the basis of the vote, the future chosen by the majority goes up on the screen. The film shows, on the basis of the audience's choice, the future consequences of that decision. I think that's a very good way to get people to see the importance of considering the consequences of making certain decisions at the present time.

Now, how should these scenarios be presented? Most of you, even though you are communication experts, will unfortunately want to write. I certainly hope I don't have to be one of the judges. I don't want to sit somewhere and read a bunch of statements. But go ahead and do it; since you are highly skilled in reading and writing, you might as well use your education for something. But consider using some alternate technologies instead, such as film, videotape, or slides. If you do choose one of these forms, you then have a rich variety of sub-techniques within these technologies.

How about animation? One of the things about the future is it's so difficult to get a clear picture of it. But you can animate it quite well. Animation also allows for metamorphosis, for showing evolutionary change in very dramatic ways.

I would consider also, in spite of the fact that you were encouraged to think in terms of half an hour, a series of shorter segments such as advertisements. You can make an extremely forceful sort of presentation in the space of let's say 30 seconds or one or two minutes at the most. Consider how much impact you can have in the dominant communication medium of the present time--namely advertising, and television advertising in particular.

Consider dramas and mini-dramas, obviously. Also, there's nothing essentially wrong with doing a documentary, a technique that is most frequently used in presenting a statement of the future. I mention once again the idea of parliamentary debates.

I would hope that some of you would think of another medium, seldom brought up in discussions of this kind. If you reflect for just a moment I think you would recognize that radio or phonograph records--some sort of aural presentation--is equally powerful. I am thinking, in particular, of the very powerful phonograph recording by Marshall McClulan called "The Medium is the Massage." He also has a book called The Medium is the Massage, and a

movie called "This is Marshall McClulan." Of the three modes, the best from my point of view is the very dramatically produced phonograph record. So, you might want to think in terms of records or aural tape.

Games, yet another way of developing a scenario, can show quite clearly future alternatives. For example, the consequences of decisions may cause the player to "Go to Jail, Pass, Go," etc. Graphic displays, not only collages, paintings, and so forth but also dioramas--3-dimensional representations--form a good basis for a scenario as well.

Finally, let me put in a word for the largest simulation device that Hawaii has going at the present time, i.e. the State Legislature. The Legislature represents a formal attempt to simulate Hawaiian society, to get us all together in a certain way to make decisions about the future. There is another game in town, too--Con Con--that is going to be played out before the next session of the legislature. You could coordinate your scenario so as to tie it in with the Constitutional Convention, and do something really worthwhile. Don't view scenario writing merely as an intellectual exercise, as a game in itself, but as a game that can have real impact.

And finally, we come to the question of what to present. This will be strictly up to you. You might want to consider seriously what George Kanahele was saying on the concept of Aloha as a possible orienting device. Some of you may be interested in writing on the imbalance between the rich and poor in terms of information flow, and the ability to communicate. This is one of the most important problems from my own point of view. In the present, only a small number of people control communication technologies and have the necessary skills to use them. Or you may be interested in focusing on the relationship between new technologies and human behavior, and the broader social and physical environment.

As I said at the outset, there is no correct way to create a scenario, but I do hope you will take some of the clues that Lewis Walkup gave you, and be as inventive and creative as you can.

HCF SCENARIO GUIDELINES

Richard Barber, L. S. Harms and Dallas Williams

Introduction

There is a growing awareness that everyone in Hawaii has a fundamental right to the communication resources required to serve his/her communication needs. But in Hawaii, many persons do not have access to appropriate communication technologies. Other persons are unable to obtain the information they need. The schools concentrate on teaching reading and writing skills but neglect the skills required by the electronic means of communication. No suitable statewide forum exists for discussion of vital public interest communication issues. At present, a number of major problems are evident.

In Hawaii, communication is one of the essential resources. Like other resources such as food and energy, socio-technical communication resources can be developed and allocated to serve human needs. The development of resources to serve needs usually involves choosing among alternatives. Such choices raise many moral, ethical, cultural values and communication rights questions which are of great importance -- present and future -- in multicultural Hawaii. The relationships and tradeoffs among communication resources, needs and rights are complex and will require policy and planning actions.

To aid in understanding the future communication policy options and communication planning requirements for Hawaii, we are encouraging the preparation of scenarios. Information about scenario preparation is presented below.

About Scenarios

A scenario is a description of one imagined future state of affairs.

In this scenario effort, we want to generate awareness in Hawaii of future problems and possibilities in communication and focus attention on policy options and planning requirements.

Scenarios usually are portraits of possible futures rather than predictions about a future event. While scenarios are not the only means for investigating the future, they have unique characteristics that make them excellent for this purpose.

Since the Hawaii 2000 effort in 1970, a strong interest in our preferred futures has existed in Hawaii. Scenarios are a tool to use in the study and discussion of our preferences.

Scenarios are of greatest value when dealing with extended future possibilities. They may be presented in various forms or combinations of forms: narratives, feature newspaper stories, data tables, graphic displays, videotape, computer games, etc. A scenario can be fashioned into a "picture" that incorporates a plausible set of relations not likely to be evident from familiar forecasting techniques.

A scenario can include a wide range of communication variables -- technological, informational, skills, public interest -- thus depicting a broad spectrum of possibilities. And it may invoke new value systems or standards for the examination of these variables, values or standards that might seem undisciplined or inappropriate if used in present-day techniques.

Ffnally, a scenario is created by persons who believe they can imagine a path into a future. Some call scenarios "future histories." Scenario creators believe the "actual" future remains elusive and that it is necessary to explore a range of potential futures with the hope that the actual future will in some useful sense be included among them.

As previously stated, scenarios come in many formats, depending on their purposes and uses.

A good scenario contains a large measure of "hidden" discipline. It need not be, should not be, dull and technical. The scenarios on Hawaii's Communication Futures should:

- utilize information available about communication in Hawaii but should not be limited by that information;
- describe one plausible path from 1977 to about 2020; describe critical events on that path; call attention to policy and planning issues;
- recognize that a plausible communication future may not at present seem either likely or socially desirable.

Guidelines

The dialog on Hawaii's Communication Futures is expected to continue for some time. The role of the scenarios in this dialog is to set forth plausible alternatives in a way that helps focus attention on actions that will need to be taken at various times in the future.

Therefore, each scenario will be judged in terms of the following five criteria:

1. Relevance. Does the scenario deal with an important aspect of Hawaii's Communication Futures in a way that permits further development?

2. Usefulness. Does the scenario provide insights, sensitivities, an idea, organizational framework, or suggestion that can be used now or in the future to guide either communication policy and/or communication planning in Hawaii?

3. Originality. Does the scenario present ideas that are new to Hawaii or does it present familiar ideas in a creative way?

4. Consistency. Do the conclusions of the scenario follow from its assumptions?

5. Communicability. Is the scenario interesting and can it be understood by persons in Hawaii who do not have specialized training in the communication field?

Conditions of Participation

1. "Mixed" author teams are strongly encouraged, for instance, a retired person and high school students; residents from two or more islands; the members of a family; local college students and a visiting professor; communication professionals/amateurs; a multicultural team; etc. "Teams" usually (but not always) produce better scenarios than "solitary authors."

2. Only previously unpublished scenarios are eligible. Scenarios must be available to HCF for publication, discussion, development and dissemination.

THE HCF SCENARIO FOR THE SCENARIOS

Richard J. Barber

The next steps in the Hawaii Communication Futures activity will involve an intensive round of informal contacts urging people to utilize these materials for the creation of another set of scenarios and position papers on the same general topic.

It is anticipated that at least one meeting will be held in the Fall of 1978 to bring together interested and active persons to discuss completed scenarios and those in progress.

Following these activities wider circulation of the papers will be sought--both to obtain additional citizen imput and to gain the attention of public policy makers.

And once again an appeal is made to you to consider yourself a major participant and leader in this process.

II SCENARIOS

Twelve original sessions are presented in this section. The first eleven were created for the Hawaii Communication Futures project. The last one was prepared as a project by students enrolled in a futures course. All scenarios were prepared by people who live and work and study in Hawaii and they describe alternative futures for Hawaii.

The reader may wish to use the categories described by Dator (see the previous section) to organize the scenarios:

Looking Backwards

Future History

Slice of the Future

Choice and Consequence

The scenarios were judged according to the five criteria (see previous section) listed in the guidelines:

Relevance

Usefulness

Originality

Consistency

Communicability

After several intensive review sessions, the judges agreed that two of these scenarios met all five criteria more fully than did the others. These two scenarios were each awarded a prize of $500.

It is highly likely that you will prefer the future described in one or two of these scenarios to the futures described in the other scenarios. If you are interested in helping to bring your

preferred future into being, a procedure for doing so is described in the final paper entitled "The HCF Scenario for the Scenarios."

The scenarios were created in a variety of media, and the editors translated those scenarios into a print format. Such a translation, while deemed necessary, nonetheless does change the impact of the various scenarios.

The two scenarios selected for awards by the judges appear first and second in this section.

THE TECHNO'S AND THE IT'S:
A 2020 Vision of Communication in Hawaii*

David Horton Shirleyann Chew Keith L. Holdeman
Kenneth G. Neifert Dennis Niimi Alan K. Okinaka

Old John Hanson gazed at the fiery sunset so common here on west Molokai, as he strolled back toward his apartment. He was reminiscing over the rather disquieting discussions of the day and asking himself just where he stood on the whole matter. The answer should have been obvious, but it wasn't all that easy.

John was very active and enjoying the good life that retirement from his many years of work for various companies in Hawaii had brought him. Of course, he had been supplementing his pension with the fruits of a quite lucrative consulting business, though even that was only being pursued on a part-time basis. Most of this work was accomplished from his office overlooking the blue Pacific. From here he had virtually instant communications with any place in the world -- and a number of places out of it! Just last evening he and his daughter Ruth had had a long talk with his grandson Ezra, who was presently completing a three-year tour of duty as an educational specialist on Lyra, the first space colony which had been established back in 2015. Ezra was considering the possibility of staying over for another three-year term but was running into difficulties in that the waiting list for positions there was quite long, and usually those on the list were taken before second tours were allowed. Lyra was a great place to work. Its climate was completely controlled -- and varied from subtropical to Alpine over the five mile length of the colony. Except for the smallness of the colony -- five miles long with a population of about 950 -- they had almost all the conveniences of Earth, with few of the inconveniences. Over half of the population was young and single, so social activities were always available. Lyra mined rare metals from the asteroids and grew some vegetables for Earth consumption. Five large space shuttles a week made the three day journey to Earth and return.

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* Presented as a play.

Through the video communicator terminals, communications were always available to Ezra and his family and friends on Earth. Old John beamed with pride, for he perceived Ezra following in steps very similar to those he had taken forty years ago.

Old John had come to Molokai in 1980 when his company had decided to demonstrate how communications could allow employees complete freedom as to where they lived. He had been selected because of his expertise in the then emerging area of "data" communications. (In those days they viewed electronic digital transmissions as something quite different from voice or video signals. Of course, for a long time now all communications had been carried in common over one broadband network.) Old John and four other employees had come to Molokai. Then it was a very sleepy little island with just the beginnings of the present quarter of a billion dollar tourist business. John had set up his home and office on the west end of the island, and from the beginning communications were adequate. He was required to make only one or two trips a month to the Honolulu office.

Spurred by this experiment, many other companies followed suit and soon quite a remote business settlement was thriving there. Today, over 1,000 people live in Kamalo, his community.

Yes, it had been a good life, but today's debate had caused him to think. Was he really happy with what he had, or could he have been more happy with the ITs? His allegiance was divided for he had a daughter and four grandchildren living in an IT community on Lanai. It was her group that had petitioned to disallow construction of a new communications satellite earth station on Molokai - for this was viewed by the ITs as likely to urbanize their community even faster. The Technos -- children of the technological era -- were pushing hard as existing communications capacity was almost exhausted, and an upcoming "Logical Jam Session" in which Japan, Australia, the United States, Luxembourg, and Nepal could be the finalists, required a new earth station. Otherwise, this session would probably be moved to Snowbird, Utah.

These logical Jam Sessions were a fallout from the quiz programs and knowledge contests of the late 1990's. They had become an annual event. A particular subject would be discussed in great detail, and top judges from around the world would determine who had built the most

logical case over a three-week period. This group received a perpetual trophy and were recognized as the top experts in their field. The Technos from Molokai had participated extensively in the past and had been the United States champions and representatives to the international Jam Sessions since 2008. For the past two years they had been the international champions, and they certainly felt their unique geographical positions and the cross-cultural environment in Hawaii had helped them greatly in their continued success and warranted the 2020 Session to be held in Kamalo!

The ITs, on the other hand, viewed all of this activity as foolishness. Their name -- IT -- had been tagged onto the proponents of "Intermediate Technology", in the late 1970's and it had stuck. The followers of this philosophy had multiplied and were attempting to live in a technological world pre-dating the internal combustion engine. They were viewed by the Technos as pests who hadn't progressed but had gone backwards, embracing the old obsolete ways as a cultural art form, and almost as a religion. They used mules, ate health foods and lived as close to the land as possible.

John's daughter had moved to the island of Lanai and joined the IT commune back in the early 1990's. At first John had been unwilling to accept this life style and for a number of years had had no communication with her. However, by the year 2000 they had been reconciled, and he visited with her and her family once or twice a year. On a number of occasions when he had visited them he found himself enjoying their very peaceful way of life. It refreshed him and sometimes he found himself wishing he didn't have to return to Molokai and the faster paced activity of the Techno society.

The meeting he had just attended was the third meeting in the current series. Democractically, this one was held under the IT rules and conditions - meeting hall, chairs, chairman, and Robert's Rules of Order. Last month's meeting, by contrast, under the Techno approach, was held via computer conferencing - an interactive process taking place over several days. The ITs hated to use the computer terminals even more than the Technos hated driving to the town hall and wasting a day there. Not that driving was difficult or expensive any more; not with solar powered air-cushioned two-seaters which had been in vogue now for about 30 years. Back in the late 80's Hawaii had developed this technology. The

vehicles were similar to the earlier internal combustion vehicles, except that they had been streamlined by removing the chrome trim and other frills and concentrating on the basics. It was generally agreed that these little bugs were among the best things to happen to Hawaii - if you had to travel, that is.

Hawaii had become internationally recognized as the manufacturer of the best of this type of vehicle; and it was one of the three industries which carried Hawaii over the past 20 years, the other two being tourism, and marine aquaculture.

These little cars the ITs didn't complain about. They liked the country lane type of grass strips on which these vehicles maneuvered. Certainly this was much better for the environment than those old relics that required the huge cement or asphalt highways -- the H-1 and the Pali Highways on Oahu, for instance - which society gave up maintaining in 2001 and hadn't really figured out what to do with since - except for the Pali strip just Mauka of the H-1 which some innovative genius had turned into a living musuem. For a mere $75 an hour you could drive anything from a 1933 DeSoto to a 1984 Orwell Sport Coupe and relive the good old days. It was sure funny to compare speed over the years - the gradual climb to 160 kmh or better in the early 70's and then the gradual decline to where we are today. And, it seemed to John to be just as well that these speed machines now existed only in the sensation alleys at the County Fairs - almost as great an attraction as the orgasmatron!

At any rate, John's Techno world and the world of the ITs remained quite separate until the volcanic bridge was established between Molokai and Lanai in 2005. The isthmus had been been the result of a demonstration of several volcanologists from the big island. They had thought it was a great idea, established a test, and artificially created an eruption which bridged the two islands together before anyone could stop them! This created the potential for the IT society to be influenced more and more by the Techno society. And from that time, the ITs were very active in fighting any extension of technology to the Molokai/Lanai complex.

It was kind of funny, as John thought about it, for although a symbiotic relationship existed between the two cultures, it was seldom recognized. Agricultural development had primarily come from the IT society, and even today most of the produce and grain used in Hawaii and in the rest of the world was produced by the ITs. The technology of the Techno's, on the other hand, had come up with many things which the IT culture depended upon. Weather control was an area which the ITs continually used to their advantage. Also, when necessary, the new innovations in travel were used by the IT people. However, by and large, these two groups were continually trying to block the other's moves; and John found himself in the middle. For while he was part of the Techno society, his ties and his sympathies he found were more and more with the ITs.

Well, tomorrow would be another day, further discussions would continue and John would be there to hear and evaluate both sides. He wanted to see the new earth station built, for even in his business at times he found that there was bandwidth shortage; and he was unable to reach other places as quickly as he would want to. Also, he had trouble seeing how this would affect the ITs on Lanai; but he recognized their concerns. More communication capability would tend to attract more Technos to Molokai, and as more people came, more would dribble over the isthmus to Lanai and before long the IT people would find that technology was making inroads on their island. Tomorrow his daughter Ruth would be testifying in the morning; and he certainly wanted to hear what she had to say. However, these thoughts were quickly dispelled from his mind as he approached his apartment and Janie came running up to him. Janie was his 8-year old granddaughter, Ruth's daughter. She was very excited with this opportunity to visit her grandpa. She came running exclaiming, "Grandpa, I'm so glad that you are coming home! Can you show me how to use the terminal so we can see some of those old Walt Disney movies? Jimmy and I have been playing with the terminal today but we can't find those movies that we especially like."

"Why, of course, Janie, we'll find those movies, but first let's try to call your cousins in Seattle and talk to them a little bit, they haven't seen you for a long time. It's been almost nine months since you visted me." Old John had to smile. Had Janie been in the Techno community, she would have been able to use

the terminal for any purpose by the time she was three years old. However, the ITs insisted upon providing education using a school room and teachers as it had been done for many hundreds of years.

The meeting place, where today's session took place, had originally been the Kamalo school. However, almost 15 years ago the Technos stopped the traditional school system, and the complex that had been the school was converted into the center for community interaction. It was in this center that the plenary debate was being conducted.

Kimo, John's grandson, lived in a community similar to and about 10 miles east of Kamalo. He now went to school on a terminal located in his room. This was a very advanced instrument. Since children have always wanted to do more than one thing at a time, it was possible to divide the 2 meter screen into sections, one part receiving a television program, while the other was being used for interactive communications. Each child was expected to spend approximately three hours a day at this terminal. A computer at a central location kept track of the student's progress, developed interactive programs for him in various subjects, and monitored his program in each area. (It also reported inadequate performance to his parents!) In this way, a child felt that his education program was unstructured. At times John wondered about this type of education; it seemed so unstructured compared to the "school" that he knew as a boy. But he also realized that much of this was only an illusion. The computer stored and analyzed all information about the progress of the student and structured a course of study for the individual on an interactive basis. The student believed he or she was developing their own schedule, but in reality the computer was programmed to make sure that all students had programs which covered the basics. In considering the education of Kimo, certainly in the areas of technology he was more advanced than Janie, who was his age but was going to school in the IT society. However, John couldn't help but feel that Janie often exhibited more concern for people and a better ability to get along with people than Kimo, so he wasn't sure which approach was better.

The Techno children were brought together every weekday for about three hours to participate in group sports and discussions. They were allowed to interact with children of various ages as well as with adults who were

asked to oversee these activities. Of course, these sessions were run and administered by trained educators. This function was primarily for the social and physical development of the youth of this community.

The terminals served many other purposes besides education. They provided access to national data bases and brought pictures and sound from virtually any place in the world. Thus, it was just as easy and nearly as inexpensive for Janie and Jimmy to talk to and see their cousins in Seattle as it would have been to have talked to someone else in their own community. Probably more than any other thing, these terminals had changed the social values of the Techno society. People of all ages could seek interaction with strangers via the terminals. One could add one's name to a list of those available for communications on particular subjects from their homes. This type of interaction could be used for games such as chess, bridge and bingo. It was also used as an on-line pen pal system somewhat like the old "ham radio" and "CB" operators. Kimo often played electronic games with their cousins on Oahu and in Virginia. When Janie came to visit her grandfather, this was one of the key attractions for her, too.

In the Techno society all members of the family, including the children, used the terminals for most of their shopping. The children learned at an early age how to gain access to the various catalogs and view the merchandise available. Of course, ordering anything required a special code which the parents controlled.

Yes, if one thing were to be chosen as representative of the communication within their Techno society, it would have to be the terminal. Of course, the present terminals bore little resemblance to the terminals of the late 1900's. Those antique models were constructed around a keyboard. Today's terminals included no keyboard. A microphone and micro-computer converted the operator's language into machine commands. Thus, keyboard skills were no longer required, not even taught any longer, except as a cultural art form. Even the simplest appliances were controlled by voice commands. Of course, terminals could respond by voice as well as graphics or visual displays. Usually the answers and responses were displayed on a colored screen. Paper copy was provided only when a request for it was made,

and since anything appearing on the screen could be stored in the individual's private data storage bank, this was seldom requested.

These terminals were not normally available for the IT children. They spent much more time in person-to-person communication. Higher education was the same for both groups, but the majority of the ITs did not pursue it. Higher education had changed drastically. Such a simple idea, but one which took such a long time to catch on! Back in the 1950's and 1960's there was some attempt to mix education and productive work instead of offering them sequentially, but the idea had never really taken hold. However, now Kimo's older brother at his 22nd birthday party which John had attended only last week, told of all the things he had done since completing his basic education requirement at 14. He had worked on a sugar plantation, in a hotel as an apprentice, had served on an ocean harvesting ship as a technician, and on the stock exchange assisting a broker. Then he had taken formal schooling at the university, and now he was entering another working phase while he studied for his masters in political science and polished his night-club act which he presented on Thursdays at one of the Community Centers.

It was hard to believe that in the old days so many different institutions had their own buildings that were used for single purposes. The Community Center was able to consolidate all these into one. John could remember from his childhood those small towns of no more than 10,000 people, but which would have perhaps four churches, three movie theatres, one live theatre, a concert hall and perhaps six schools. It was hard to believe. Of course, the cost of labor and the energy crisis in the 1970's and 1980's put a stop to all that nonsense. Today most of these activities were all scheduled in the community center. (It sure would be funny if the computer fouled up and gave the audience the Kasbah Nightclub decor for the Methodist Revival Night, but the computer systems were very reliable by now and such foulups never occurred -- well, almost never!

This center was used by all the age groups in the community. Old John's grandsons were taking woodworking with him in the same class. The credits which were obtained in these training sessions were transferred to the student's academic center, wherever it was. Even John had a current educational record at the University of Hawaii, where his last formal training had been taken, and these records were kept current at all times.

Well, enough of this reminiscing. He knew there would be many looking to him to express himself in the discussion after tomorrow's session. Certainly there were good points on both sides, but he had spent his whole life developing new communication systems and improving existing ones. During his long career he had seen the many social benefits derived from the technological revolution in communications. The "Logical Jam Session" and the argument over holding it in Kamalo was clouding the issue. Molokai needed the satellite earth station with or without the jam session. The recent agreement on world standards for transmission of olfactory information and the continuing experiments in extending the range of tactile sensation transmission (which was mostly a problem of adequate terminal devices of man-machine coupling) would require the added bandwidth. His background and years of training would only permit one conclusion.

He decided that before going to dinner, he would call Ruth, who was still at the community center, and tell her what his position would be.

MY PAST--YOUR FUTURE: The Gift of the Historian*

Frank J. Derfler, Jr.

People of the old earth, people of the old earth (interstellar winds in background) hear me. You thought of me so I came to you. I am the historian. I have come to speak to you of my past and of your future.

Take my book, open it carefully. This time conjuncture does not allow me to discuss all of the things in it with you. So read it yourself--with care.

Let us look together to the time of the late 1970's. The early years of the 1980's. These times were the times we historians call the period of the 2 T's: Terror and Technology. Terrorism, for whatever reasons, rose to the nuclear level. These horrors combined with the other more normal nuclear incidents to have an effect that lasted for over a decade, as we shall see.

Technology involved the mass profileration of personal computers and personal and commercial computer networks over every imaginable carrier and transmission media and, also, the fruitful marriage of computing and electrical optical devices.

Technology also means leakage and nuclear explosions at atomic power plants in the United States. These incidents and the terrorist use of nuclear devices led to an atomic phobia throughout the industrialized nations. A critical factor in the 70's and 80's was the avoidance of nuclear war between major powers. If this had not been avoided the time line would have been much different.

General public light broadcasts began first in the place called Honolulu, Hawaii. These broadcasts, first made by those who would have been amateur radio operators, citizens band operators, the publicists and dramatists of another age, came from the mountain tops and came from the tall buildings to the people, via light. They were unregulated and uncontrolled but with great bandwidth. They transmitted digital information, analog information, voice, data, stock market reports, back fence gossip. The clear air, the mountains and the concentrated population in Hawaii all came together with the right time and proper technology to allow the voice of the people to be seen and heard over light. Of course commercial broadcasts were soon to follow. Regulation of the health hazards from transmission in the ultra-violet and infra-red bands became a real concern. The anti-nuclear paranoia hit at about the same time that the last of the easily obtainable

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* presented via scroll and audio tape.

fossil fuels were running out. This led to the period known as the lean years. Inflation and lack of natural resources were the major factors during this period.

In Hawaii, the results were mainly economic. Tourism declined drastically, but the impact of limited fuel for heating, production of electricity and for transportation was not felt physically like it was in so many other places around the world.

The concept of storage of power in the electrical distribution grid was easily implemented in Hawaii. This was both because this grid and Hawaii were isolated from the inter-locking grid networks such as found in the mainland and because of the abundance of wind and sea wave power. The electrical grid, serving as a storage media and running from a variety of power sources, provided the heavy load needs. Solar and wind power picked up the luxury needs like computers and television sets in most homes.

The lean years were made leaner by harsh winters and short summers in Canada and upper U.S. The world was not only short of fuel but getting tight on food also. But technology did not stop during the lean years. It did not, however, disburse to as many countries and people as it might have.

In the early 1990's Hawaii had two main thrusts of technical activity. The first was in the area of aqua culture -- farming the ocean for its food source and protein. And the second involved the ocean partially, too. And that was the production of power eventually for export using sea wave power, geothermal power and wind power so abundantly available.

In the area of communications, optical techniques had replaced all metallic conductors at the signal level. Optical communications via satellite and one megaband and higher rates became common. Three factors worked to end the lean years. The first was an amalgamation of various power sources which replaced fossils and used electricity fed into the already existing and paid-for power grid using electricity as their common working form. Some degree of reliable control over the weather was also found. This control was limited, it was primitive and it certainly was not without its tradeoffs. But it became available and practical. Third and perhaps most importantly was the biological re-evolution.

The biological re-evolution was in two parts. The first came in the growth of replacement body parts. Persons who needed replacement body organs due to disease or accident were able to have these grown in laboratories and have them implanted into their body. The second part

"YOUR FUTURE --
MY PAST"
AS GIVEN TO
FRANK J. DERFLER JR.
BY
THE HISTORIAN

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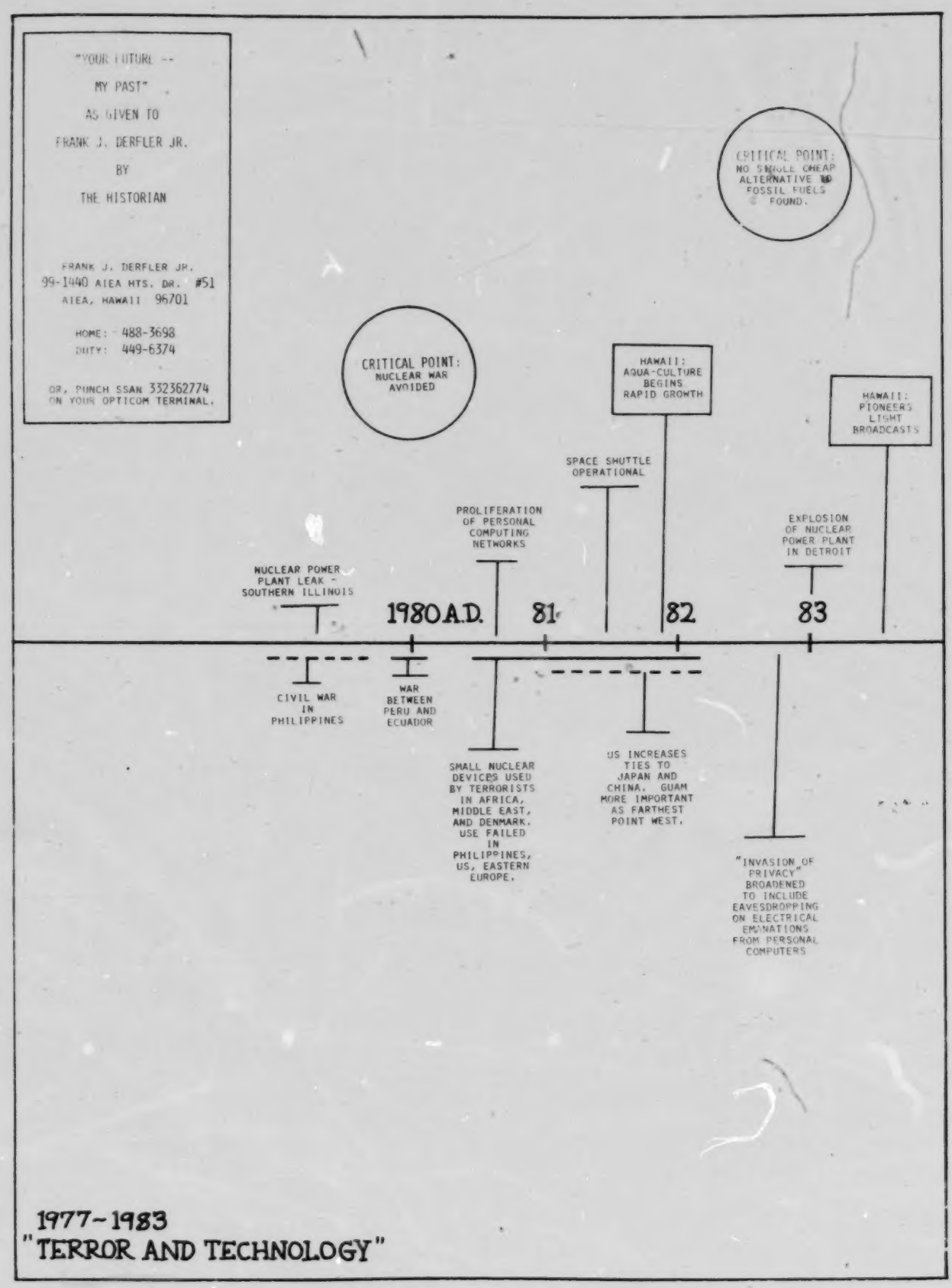
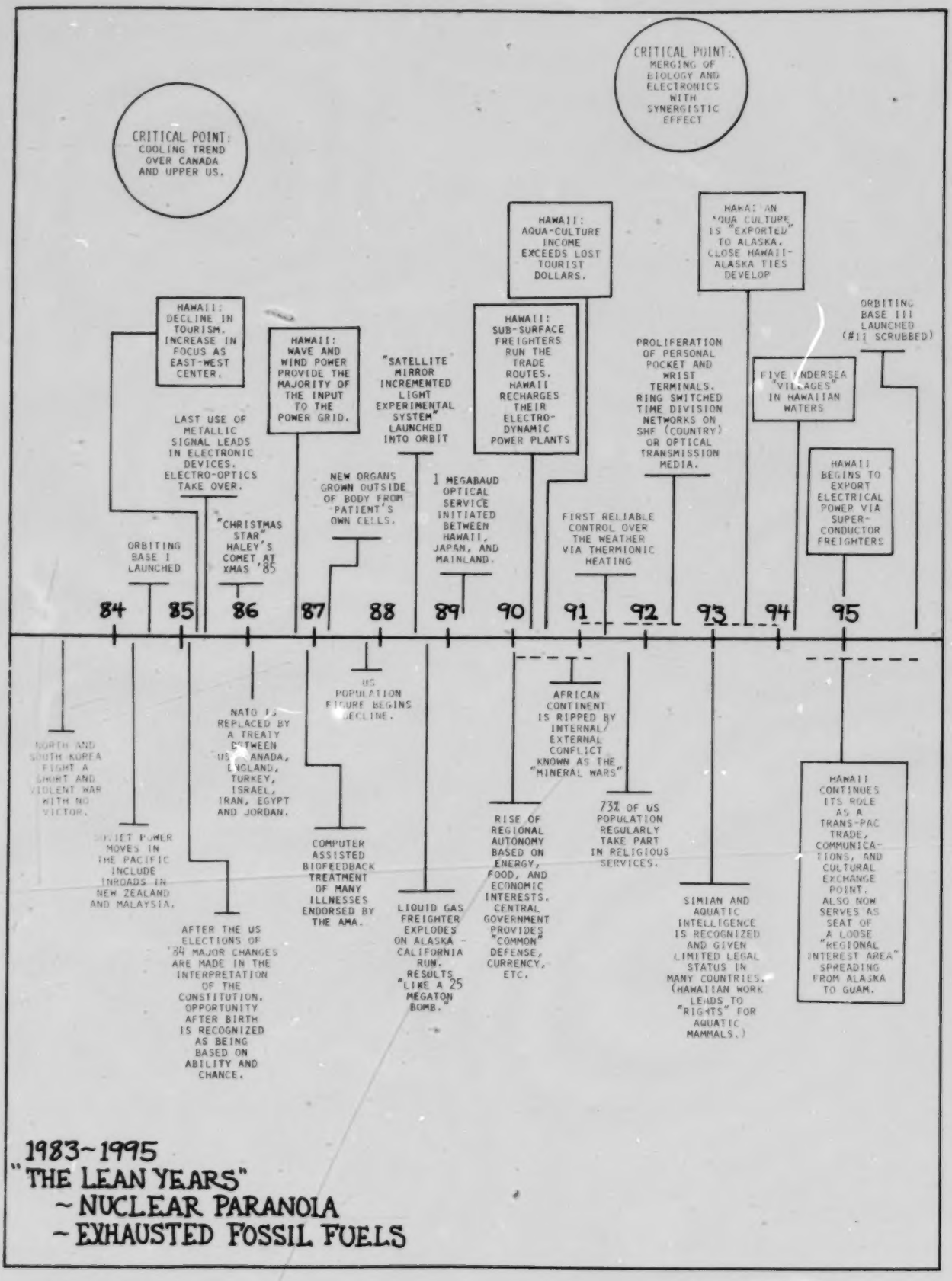


1977-1983
"TERROR AND TECHNOLOGY"


CRITICAL POINT: COOLING TREND OVER CANADA AND UPPER US.
CRITICAL POINT: MERGING OF BIOLOGY AND ELECTRONICS WITH SYNERGISTIC EFFECT
HAWAII: DECLINE IN TOURISM. INCREASE IN FOCUS AS EAST-WEST CENTER.
HAWAII: WAVE AND WIND POWER PROVIDE THE MAJORITY OF THE INPUT TO THE POWER GRID.
"SATELLITE MIRROR INCREMENTED LIGHT EXPERIMENTAL SYSTEM" LAUNCHED INTO ORBIT
HAWAII: AQUA-CULTURE INCOME EXCEEDS LOST TOURIST DOLLARS.
HAWAII: SUB-SURFACE FREIGHTERS RUN THE TRADE ROUTES. HAWAII RECHARGES THEIR ELECTRO-DYNAMIC POWER PLANTS
HAWAII AN AQUA CULTURE IS "EXPORTED" TO ALASKA. CLOSE HAWAII-ALASKA TIES DEVELOP
ORBITING BASE III LAUNCHED (#II SCRUBBED)
PROLIFERATION OF PERSONAL POCKET AND WRIST TERMINALS. RING SWITCHED TIME DIVISION NETWORKS ON SHF (COUNTRY) OR OPTICAL TRANSMISSION MEDIA.
FIVE UNDERSEA "VILLAGES" IN HAWAIIAN WATERS
HAWAII BEGINS TO EXPORT ELECTRICAL POWER VIA SUPER-CONDUCTOR FREIGHTERS
LAST USE OF METALLIC SIGNAL LEADS IN ELECTRONIC DEVICES. ELECTRO-OPTICS TAKE OVER.
NEW ORGANS GROWN OUTSIDE OF BODY FROM PATIENT'S OWN CELLS.
1 MEGABAUD OPTICAL SERVICE INITIATED BETWEEN HAWAII, JAPAN, AND MAINLAND.
FIRST RELIABLE CONTROL OVER THE WEATHER VIA THERMIONIC HEATING
ORBITING BASE I LAUNCHED
"CHRISTMAS STAR" HALEY'S COMET AT XMAS '85
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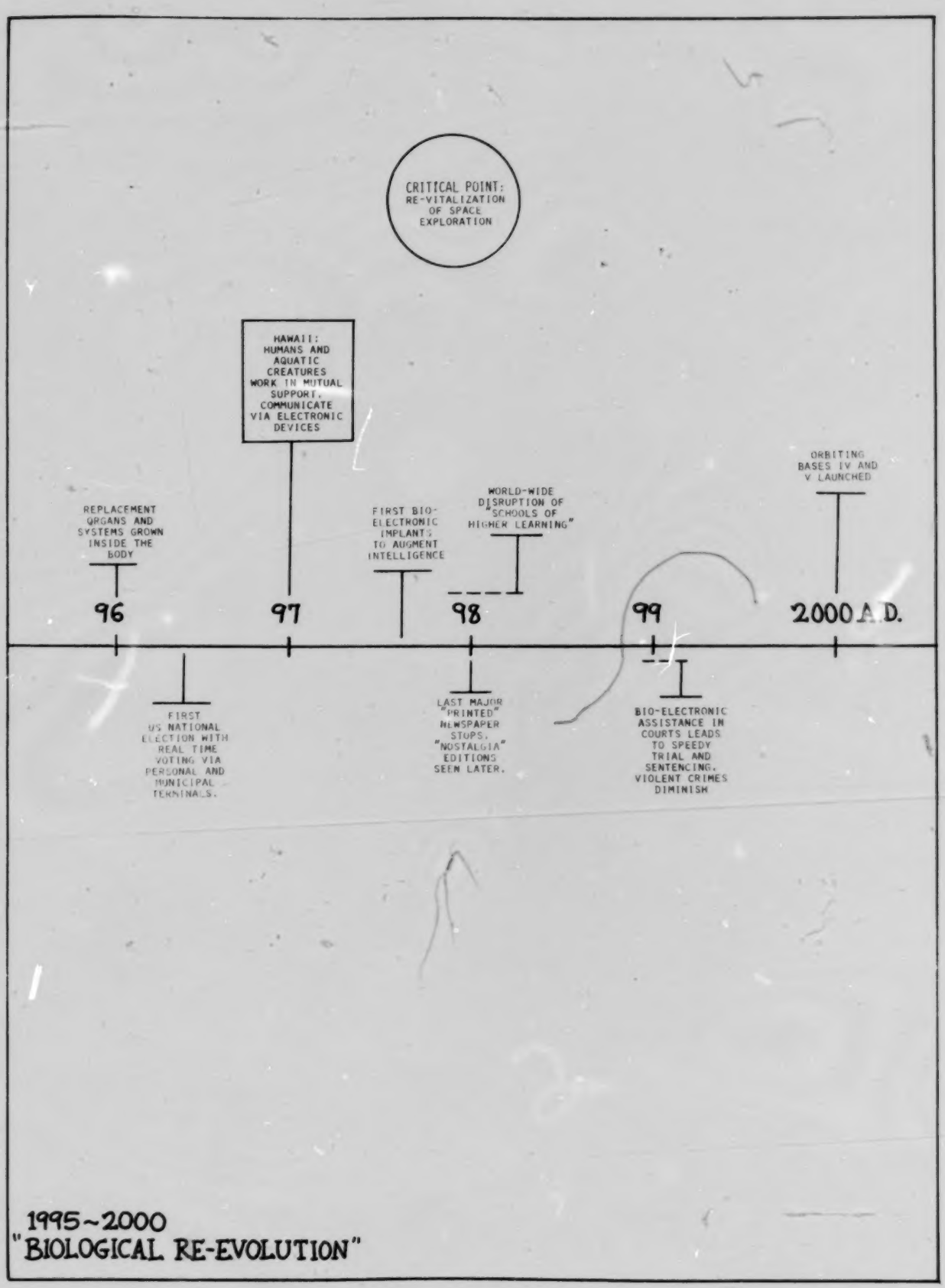
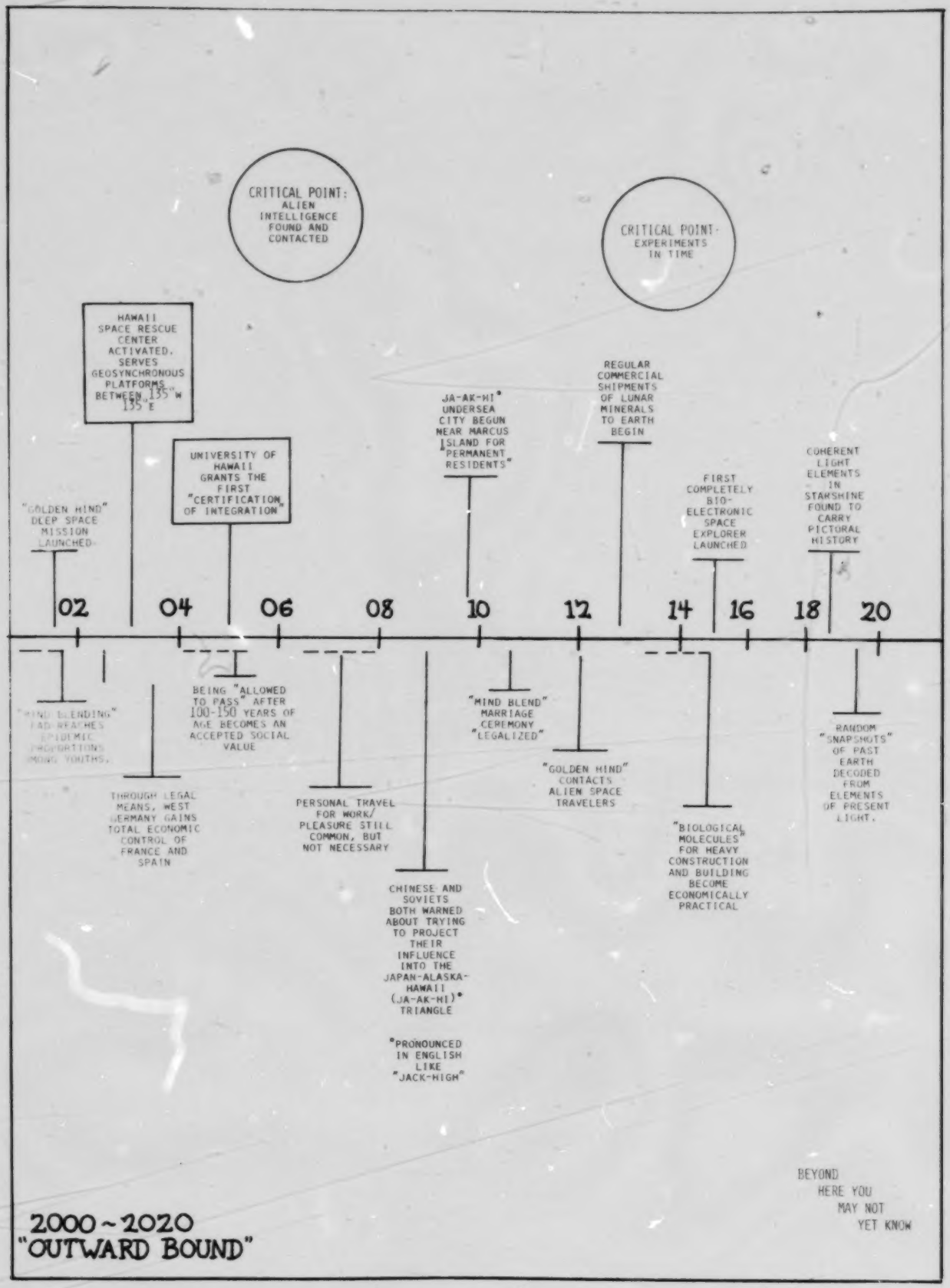
NORTH AND SOUTH KOREA FIGHT A SHORT AND VIOLENT WAR WITH NO VICTOR.
SOVIET POWER MOVES IN THE PACIFIC INCLUDE INROADS IN NEW ZEALAND AND MALAYSIA.
AFTER THE US ELECTIONS OF '84 MAJOR CHANGES ARE MADE IN THE INTERPRETATION OF THE CONSTITUTION. OPPORTUNITY AFTER BIRTH IS RECOGNIZED AS BEING BASED ON ABILITY AND CHANCE.
NATO IS REPLACED BY A TREATY BETWEEN US, CANADA, ENGLAND, TURKEY, ISRAEL, IRAN, EGYPT AND JORDAN.
US POPULATION FIGURE BEGINS DECLINE.
COMPUTER ASSISTED BIOFEEDBACK TREATMENT OF MANY ILLNESSES ENDORSED BY THE AMA.
LIQUID GAS FREIGHTER EXPLODES ON ALASKA - CALIFORNIA RUN. RESULTS "LIKE A 25 MEGATON BOMB."
RISE OF REGIONAL AUTONOMY BASED ON ENERGY, FOOD, AND ECONOMIC INTERESTS. CENTRAL GOVERNMENT PROVIDES "COMMON" DEFENSE, CURRENCY, ETC.
AFRICAN CONTINENT IS RIPPED BY INTERNAL/EXTERNAL CONFLICT KNOWN AS THE "MINERAL WARS"
73% OF US POPULATION REGULARLY TAKE PART IN RELIGIOUS SERVICES.
SIMIAN AND AQUATIC INTELLIGENCE IS RECOGNIZED AND GIVEN LIMITED LEGAL STATUS IN MANY COUNTRIES. (HAWAIIAN WORK LEADS TO "RIGHTS" FOR AQUATIC MAMMALS.)
HAWAII CONTINUES ITS ROLE AS A TRANS-PAC TRADE, COMMUNICATIONS, AND CULTURAL EXCHANGE POINT. ALSO NOW SERVES AS SEAT OF A LOOSE "REGIONAL INTEREST AREA" SPREADING FROM ALASKA TO GUAM.

1983~1995
"THE LEAN YEARS"
~NUCLEAR PARANOIA
~EXHAUSTED FOSSIL FUELS



1995~2000
"BIOLOGICAL RE-EVOLUTION"


CRITICAL POINT: ALIEN INTELLIGENCE FOUND AND CONTACTED
CRITICAL POINT: EXPERIMENTS IN TIME
HAWAII SPACE RESCUE CENTER ACTIVATED. SERVES GEOSYNCHRONOUS PLATFORMS BETWEEN 135° W 135° E
UNIVERSITY OF HAWAII GRANTS THE FIRST "CERTIFICATION OF INTEGRATION"
JA-AK-HI* UNDERSEA CITY BEGUN NEAR MARCUS ISLAND FOR PERMANENT RESIDENTS"
REGULAR COMMERCIAL SHIPMENTS OF LUNAR MINERALS TO EARTH BEGIN
FIRST COMPLETELY BIO-ELECTRONIC SPACE EXPLORER LAUNCHED
COHERENT LIGHT ELEMENTS IN STARSHINE FOUND TO CARRY PICTORAL HISTORY
"GOLDEN MIND" DEEP SPACE MISSION LAUNCHED
02
04
06
08
10
12
14
16
18
20
"MIND BLENDING" FAD REACHES EPIDEMIC PROPORTIONS AMONG YOUTHS.
THROUGH LEGAL MEANS, WEST GERMANY GAINS TOTAL ECONOMIC CONTROL OF FRANCE AND SPAIN
BEING "ALLOWED TO PASS" AFTER 100-150 YEARS OF AGE BECOMES AN ACCEPTED SOCIAL VALUE
PERSONAL TRAVEL FOR WORK/ PLEASURE STILL COMMON, BUT NOT NECESSARY
CHINESE AND SOVIETS BOTH WARNED ABOUT TRYING TO PROJECT THEIR INFLUENCE INTO THE JAPAN-ALASKA-HAWAII (JA-AK-HI)* TRIANGLE
*PRONOUNCED IN ENGLISH LIKE "JACK-HIGH"
"MIND BLEND" MARRIAGE CEREMONY "LEGALIZED"
"GOLDEN MIND" CONTACTS ALIEN SPACE TRAVELERS
"BIOLOGICAL MOLECULES" FOR HEAVY CONSTRUCTION AND BUILDING BECOME ECONOMICALLY PRACTICAL
RANDOM "SNAPSHOTS" OF PAST EARTH DECODED FROM ELEMENTS OF PRESENT LIGHT.
BEYOND HERE YOU MAY NOT YET KNOW
2000~2020
"OUTWARD BOUND"

of the biological re-evolution came with bio-electronics. The bio-electronics of the late 1990's created an intellectual, moral, physical and social revolution. Were these implanted elements biological protoplasm? Yes, yes they were. Were they electronics? Yes, they were that too. But the real breakthrough was in the parallel processing and low-powered interphase between bio-electronics and the human nervous system. Bio-electronic devices had been used earlier to aid persons with physical motor control problems. But for the first time a bio-electronic interphase provided augmented intellect to its host. In effect, memorization became a thing of the past. Facts, in the form of extremely large scale integrated circuit memories, became available in a parallel input-output format to the human brain, for the first time, without the need of an intermediate media such as sight or sound. This came naturally to a populace that was already conditioned to having terminal devices in their pocket or on their wrist. It was a welcome improvement to have a terminal device that you could think to.

Hawaii, too, benefited from bio-electronics. Bio-electronics helped to more securely bridge the gap between humans and certain aquatic mammals. This bridging aided the attempts to establish some permanent undersea installations and help to further improve aqua culture.

1997 was the year when the last major printed journal ceased publication in the U.S. Oh, nostalgic publications still hung on, but regular publications were replaced by terminal broadcasts.

During the entire period of the late 90's and on into the next century, a movement leading toward regionalism spread throughout the Northern Hemisphere. This movement caused the central and state governments to give up certain powers to loose regional confederations. These regional confederations had common interest based usually on natural resources and economic factors. The north-eastern states, the old South minus Texas, and the Southwest, Northwest and Middle-western states all amalgamated on the basis of common interests. Hawaii became the center of a regional interest between Alaska and Hawaii and on into the Polynesia and Guam areas. Aqua culture ties between Alaska and Guam became particularly strong. The two decades between the year 2000 and 2020 were known as the Outward Bound times. Space exploration became revitalized. The space shuttle had provided greatly reduced launch costs in the early 1980's but the lean years prevented full realization of the potential for space exploration.

Bio-electronics, increased life spans and improved economic conditions turned man's eyes once again to space.

Improved orbiting bases and deep space probes were launched in quick succession. Hawaii became a deep space and geo-synchronous satellite rescue center.

In communications, automatically translated human languages, because of the commonality of machine languages or protocols, became possible. With common machine language, the exterior program language, whether it be Japanese or English, made little difference. The terminals were able to talk together and provided an accurate, although sometimes not always grammatical, translation.

Travel for business and for pleasure was still common in this period although not considered to be necessary. One thing was found to be necessary, however; and that was the gathering out of the children together in a place called a school. Children did and still do gather together in schools to learn motor skills and to practice peer group socialization. In higher education, degrees were replaced with something called the certification of integration. The certification of integration shows that the student could assess, integrate and use at least 82 percent of all information available from many sources including bio-electronic augmentation, memorization or whatever was available.

Two critical points occurred close together at the end of the second decade of the 20th century. The deep space mission 'golden hind' found and contacted another space exploring civilization. After all the years of man's waiting, all the years of man's dreaming of contacting an alien intelligence, it was anti-climatic. We found we had almost nothing in common except space itself. We had no cultural heritage, we had no ties, we had little technology to exchange. Indeed we found we had much more to share with dolphins and chimpazees than we had with this race from another solar system.

In about the same period the first experiments with time began. Laboratories on the moon found elements of coherent light, or star shine, that presented pictures of past events. The experiments moved on from there to an examination of samples of earth light. More work on the nature of time, speed of light and the warp of space led to developments and to discoveries you cannot know of yet.

This time conjunction is about to come to an end. People of the old earth, think of your future. Think of the best that you can do with what you know, (background winds again).

BABEL, BUT BENEFICENT

Jesse Y. Bowman

I don't have to recite for you the problems we confront -- dwindling energy supplies, environment degradation, squeezing populaces everywhere -- because here in the Islands we know in small measure the big distresses of all the world. But as a base for our scenario let's define where we are now, because we can perhaps build on our history.

It was our lucky fortune that accidents of location, time and nature combined to bring together a basic polynesian spirit in a paradisical land, a rich acculturation of oriental and haole and polynesian to take advantage of it and an overlay of aloha. But the world began to turn sour a little while ago, and some of us were taken by the "moat syndrome." We're here, we said, so pull up the drawbridge. We didn't make that work, and it seems that energy shortage and economical constraints will do it for us instead.

We have had to turn to other pursuits to keep alive, and as is true with so many human endeavors we may have backed into it. Oh, we kept on building warrens for the visitors to sleep in and shops where they could buy souvenirs, because that's where the promise of money was. [SLIDE 1 -- Waikiki waxed wildly] They kept on crowding the beaches and the slopes until it seemed the islands would subside under the weight. And for a while tourists kept them filled.

But in a non-tourist valley appeared a beginning, a start at bringing together people in pursuit of a special topic. [SLIDE 2 -- World between worlds] There, in the Hawaiian ambience, outside influences could be subdued and communicaiton could be enhanced. At that time communication was possible because Japanese had been schooled in the English language, and there were some in Hawaii who spoke Japanese.

Several foresighted thinkers in the Islands saw the possibility and promise of similar ventures in inter-cultural communication. They encouraged conferences and institutes on subjects that would bring visitors to Hawaii, and enjoyed early successes with such things as a convention of the Pacific Area Travel Association where many lands were represented. With continuing successes and more meetings it became apparent that better communication was needed. The natural result? Hawaii had to set up and maintain its own staff of simultaneous interpreters patterned after the hundred people at the United Nations who poured out one of the seven languages used

there as translations of what was said on the floor. The difficulty was that the supply of such people was limited to about 300 people in the world who could do the job, and that restriction of interpreters put a lid on the number of conferences that could be held.

Then galloping technology came to the rescue. Early experimenters had toyed with machine translation, obtaining promising results from word processors with specially keyed lexicons in their memories, but it wasn't until microminiaturization expanded man's power to calculate and communicate that electronic interpretation became possible. Seed money from several sources helped in the development -- Japan, the Hawaii Visitors Bureau, University of Hawaii, East-West Center -- and the first project was the Japanese interpreter-translator.

Do any of you here remember what a tough job that was? Japanese was a challenge, but since Japanese money was involved we had to do it. The project nearly foundered several times, you know, but each time a little unexpected funding or a step towards the goal kept work going. Success came about the turn of the century, and then we started on Chinese. If we thought Japanese was a hard problem, we hadn't yet come to Chinese with its intonations piled on top of the semantic problems.

From there we can pick up recent history -- the increasing use of patching satellite circuits into the machinery here for news dissemination and communication purposes while the conference and scientific use built up. But now, although it's not generally recognized, Hawaii faces a diminishing role in future world affairs unless we can come up with some new ideas to pull success out of a world of sharply decreasing travel, lack of any room for expansion here and advancing technology threatening to leave us behind. To pull those problems into focus, let's look at where Hawaii's money has come from in the past and how it might be in the future. [SLIDE 3 -- Hawaii's money sources] Up until 1990 tourism had been replacing sugar and pineapple as the main income-producer besides the federal agencies, and we were fortunate that BABEL was coming into use about that time to provide some income. It has built up -- as you see -- until it's approaching a third of our total income for the Islands, surpassing Federal monies and approaching Pleasure Tourism. But now with energy about all used up the end of pleasure tourism is here, and where will our money come from then? It seems sure that we must find new sources of income in our BABEL enterprises -- and since that's communication, your challenges are clear to find solutions and put them into scenarios!

Let's again refresh our understanding of where we are and where we tend by retracing our steps. How did we get where we are today with BABEL?

First, do any of you remember your Sunday School lessons with the pictures of the Tower of Babel? [SLIDE 4 -- Biblical Babel] We of Hawaii managed to escape the wrath of a deity angered at the audacity of a people who would build a tower to Heaven instead of working for it, a deity who confounded the people by inflicting a myriad of tongues on them; we eased the problems of many tongues with our developments but used the name of BABEL to signify our many-tongued culture.

Electrons did it, of course. Man had been playing with them for half a century and taking faltering steps into radio and television and calculation until the opening up of solid state physics and microminiaturization allowed him to build his devices with overpowering complexity in vanishingly small spaces. When it came, it came with suddennness. [SLIDE 5 -- Shrinking electronics] and man's electronic products rivaled his brain in computation and memory capacity for each cubic centimeter.

Even before the shrinking began, however, he had been experimenting with speech-into-machine conversions and vice versa. The telephone company's Vocoder was an early example, and even in the 1960's there were computers -- word processors -- which could take programmed inputs in one language and turn them into word outputs in another language, using an internal memory of equivalents. You can see in such rudimentary devices as this one [SLIDE 6 -- Primitive translator]that the germ of today's BABEL existed in the mind of someone.

The problem was, of course, the memory capacity needed. What we take for granted today in memory capacity was an impossible challenge until miniaturization began. One of the first strides was illustrated in a text of the time, 50 years ago [SLIDE 7 -- Now that's itty bitty] That was one of their memory elements, and enabled them to take a great stride in shrinking memories. Even that wasn't enough to make a BABEL practical, but soon came more reductions in size and multiplications in capacity, and memories and logical storage of a size needed for translators-interpreters became practical economically, even though we have run into the Heisenberg limitation.

When that happened, linguists leaped into the fun and joined the word-processing developers. That was the enjoyable time, the time of venturing into new technical territory, the area of bridging from surface semantics into deep structure. An example of the problem -- in those days -- was how to get to the deep structure and mechanize the transformation [SLIDE 8: What did he say?] The linguists probably had more fun than the engineers; they found the new machinery a powerful tool in their researches and the feedback it gave them speeded up their learning into the deep structures

common among the languages and the various transformations necessary and the equations of logic involved in each language to pass from one to another.

At the risk of exposing you to a boring show of everyday methods, I present a picture of how person-to-person interpreter screens look today, in case you haven't seen one recently [SLIDE 9 -- Modern translator], [SLIDE 10 -- What did you say?]. Speech of language is analyzed, its frequency patterns compared with a memory's capacity to formulate the values of the transformation into deep structure, the deep structure meaning compared with the memory for language B and the transformation made into language B in the modulator; the result is presented in audio tones and in character display on a screen to the B speaker. A similar path (not shown) takes B's speech through the identical process and produces language A in sight and sound.

The way it looks to the speakers is this. You see your speech -- as uttered and analyzed in the first step -- on a screen. If your accent or your hesitancy has garbled your meaning, you can say it again -- and again, if necessary, until the screen shows what you think you mean. Then your speech is shown after it has gone through the deep structure and been reconstructed into language B and then gone back through the other path to get back to your language. If the translator hasn't quite got it, or if the transformations haven't done the job, you can re-phrase your utterance and see if another expression gets through better. That way you can see how much you have suffered in the translation.

As an aside to those of us here who are communication workers, linguists and such, we all recognize the enjoyment during the past 30 years had by those who worked along with the development of BABEL. The original Whorf-Sapir hypothesis saying we're captives of our languages was first shown to be plausible by the many illustrations that came up as one deep structure's similarities and differences with another were brought to light, and then how -- we think now -- those comparisons in full light are diminishing the bonds. And where there were many t/k dialects fifty years ago, thanks to the worldwide exposure of one language to another there are now only a few. And because there are more nearly similar "views of reality" now because of the melding effect of BABEL, there is less friction among different peoples.

But perhaps happiness is a thing called "the past tense," though, as tomorrow's penalties press upon us. We're just about at the end of the energy supply [SLIDE 11 -- The lamps are going out] and that means Hawaii is losing year by year the input of money from pleasure travel. But can that have a hidden blessing? As more people have to stay home, does that mean they'll need -- and want -- more and fundamentally different communications? That's precisely what we invite you to tell us.

We may get one clue for our thinking in looking at the recent changes in communication services provided by BABEL [SLIDE 12 -- Whither do we tend?] Only a trickle before the turn of the century, translation of literary works utilizing the vast memories in banks here and the satellite facilities controlled from here has blossomed into a sizable share of the message traffic -- inputs by the satellite network from anywhere and transmission of translated copy framed in typesetting command language to the publishing centers in Singapore, Rio and Atlanta. The flow of one-to-one personal chats through our BABEL has always been a standby, as a Frenchman's call to his Urdu counterpart flows through BABEL's banks for interpretation. Data has always been a standby, too. As a wit of long ago named Parkinson observed, government grows inevitable, and such use in world politics and propraganda has always been with us. Commercial use seems to have diminished, but really its volume has remained about constant on an absolute basis although its percentage of BABEL utilization has dropped. The other usage -- scientific -- has been a late-comer, and now is more than any single use; this has come because the engineers and scientists themselves managed to discover the deep structure of scientific communication among disciplines and are now able to converse one to another. Whether this trend will continue we can't know today; we doubt that this usage will last.

And the various specialists who have been bringing the powers of BABEL communication to today's peak, predict that they will not stumble on so many advances in the future, so that possibility should be discounted, they say.

I encourage you to look at the area of news dissemination although it might be thought we're as far as we can go in that respect. That's what news media thought half a century ago, but look at what's happened with the translation capacity of BABEL. First, here's where they were fifty years ago, with electronics just beginning to invade the domain of the printed word [SLIDE 13 -- News use] There, an inexperienced newsman could enter his thoughts into a machine and have it register them, translate them into typesetting commands, formalize his arrangements and occasionally reply to him with either approbation or censure.

What a contrast to today, when we collect news from services everywhere, written in many languages, translate to one language, edit, rewrite, illustrate, check, verify and polish, then retransmit to selected centers the news in all 26 standard languages for further dissemination in broadcast vision and in facsimile to homes and businesses everywhere [SLIDE 14 -- World to the world]

There you have our current monopoly. Hawaii is the world news center, thanks to our early pioneering in simultaneous translation for conferences followed by application of money and research into electronic interpreters and translators and a natural evolution into news translation and handling. But, now comes the but. We're faced with more and more areas who want to put their own slant on news handling and who want to do more of the job themselves. The latest advances in solid state electronics have just about got to the point where they can do with a few millions of dollars the things they want to do -- and shut out of competition us here in Hawaii -- we who got the whole thing started. So we're faced with the possibility of losing some of that revenue ground just at the time when our tourist travel is heading down the downslope.

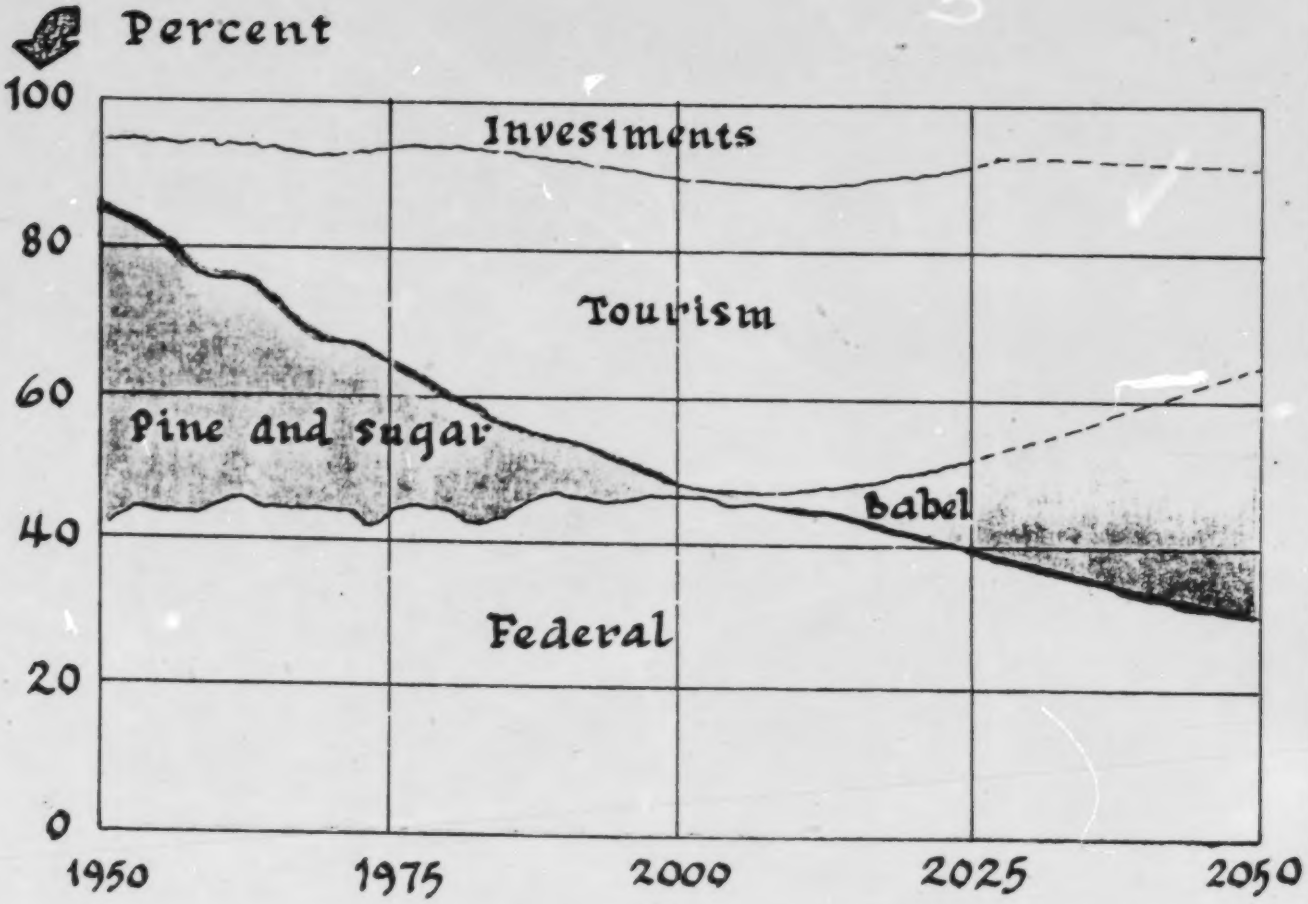
Perhaps we can do no better than repeat something that once worked, and started Hawaii on this upswing that's lasted for half a century. I ran a scan the other day in an old memory and stumbled across a report of an exercise that called for communication scenarios -- way back in 1977, I think it was -- which produced ideas that were germs of the things we're talking about today as commonplace.

Who knows? We may be lucky again. So put your imagination and your expertise to work. Let's find out if history repeats.

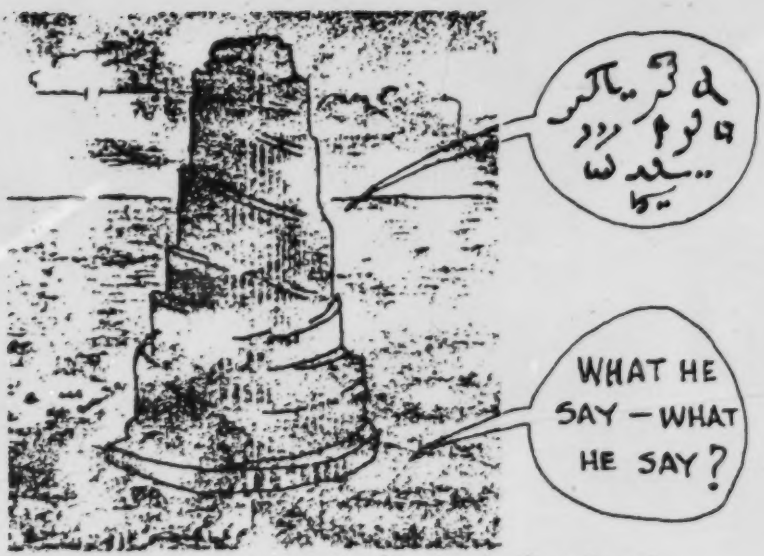
I hope it will.

1. Waikiki waxed wildly

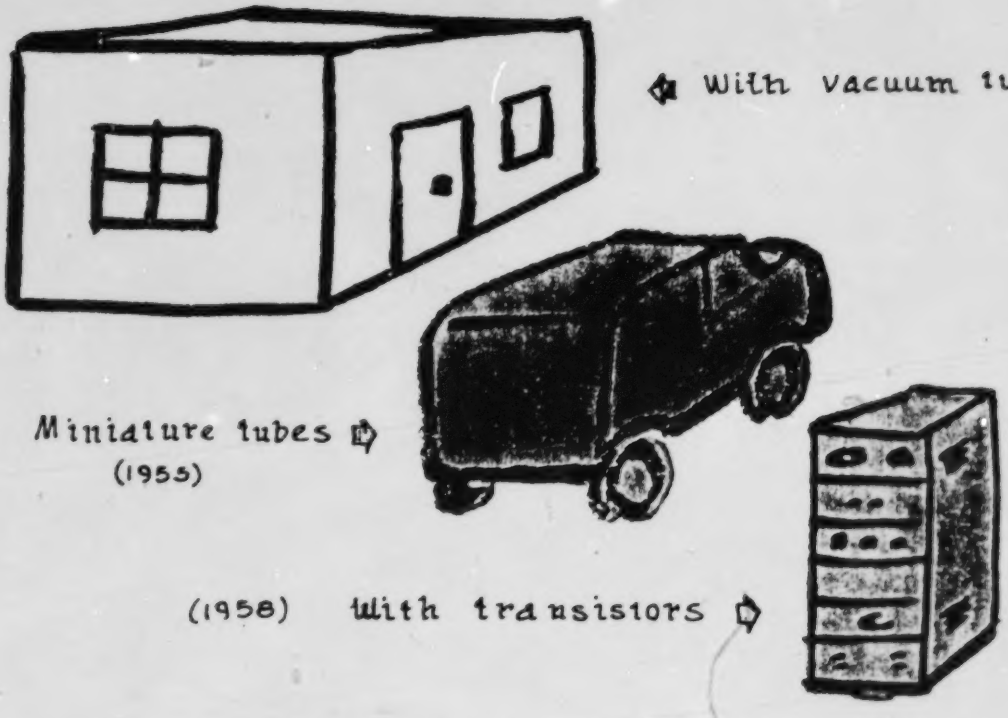
2. Word between worlds



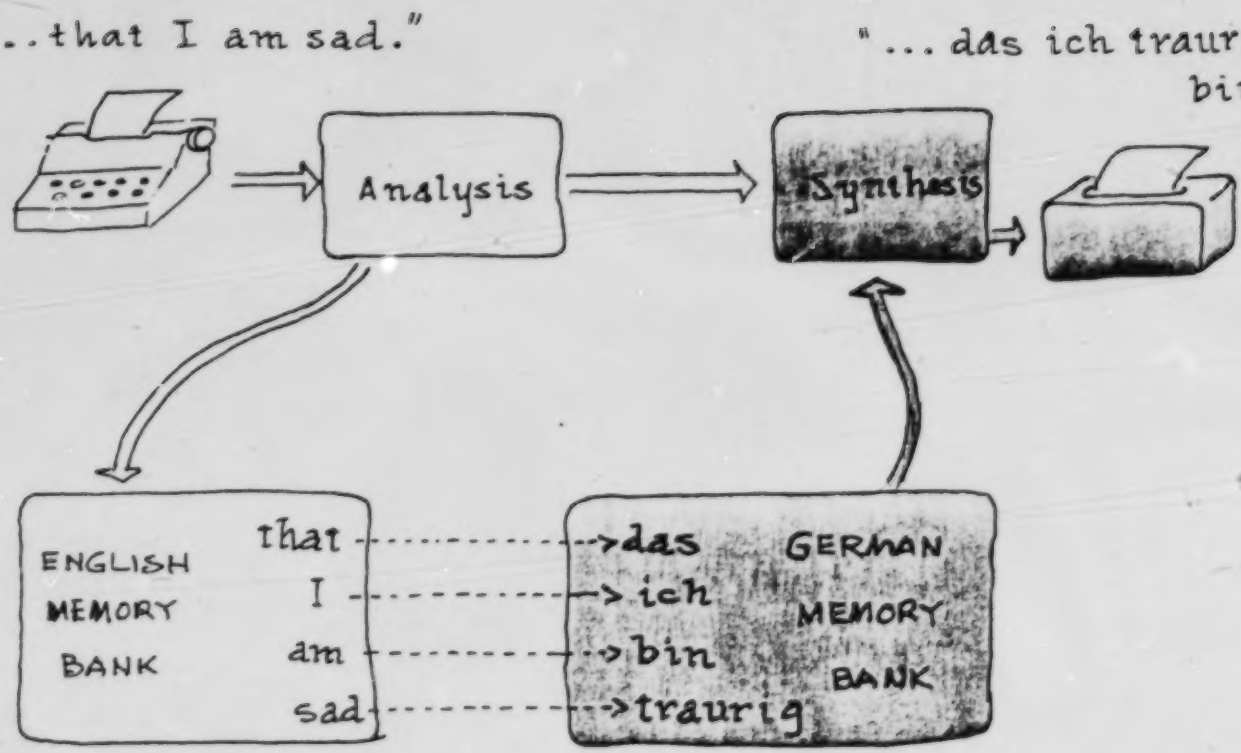
3. Hawaii's money sources



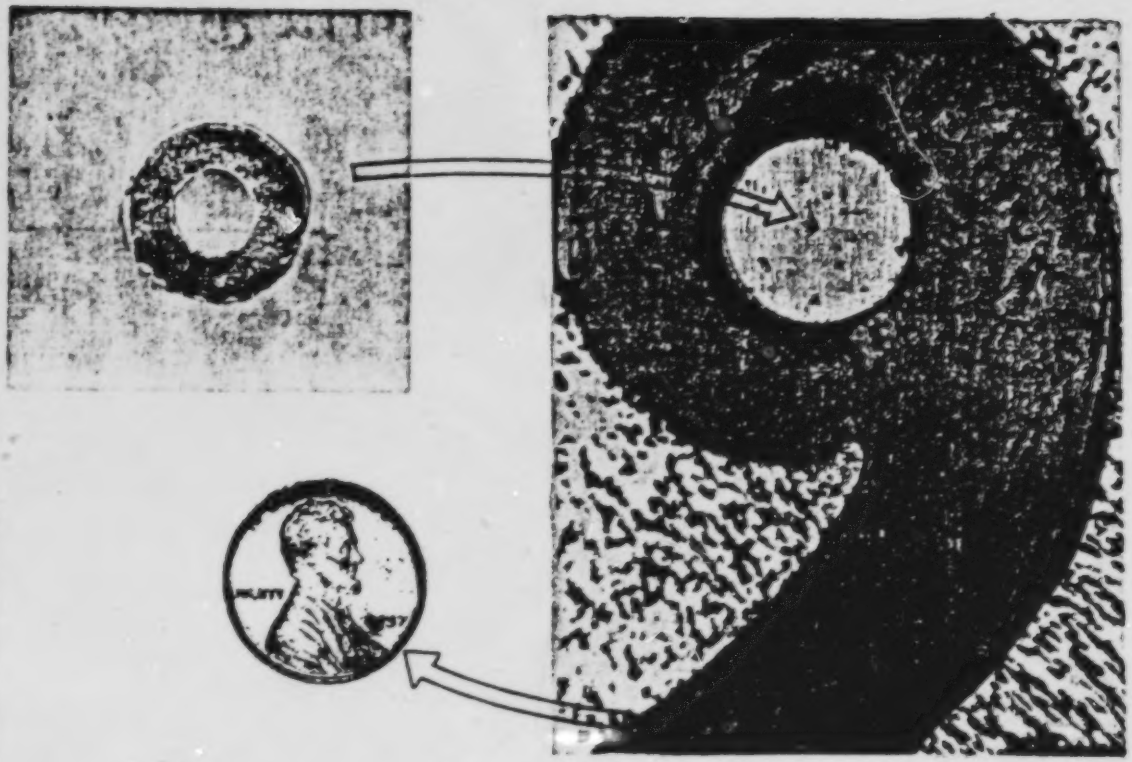
4. Biblical Babel



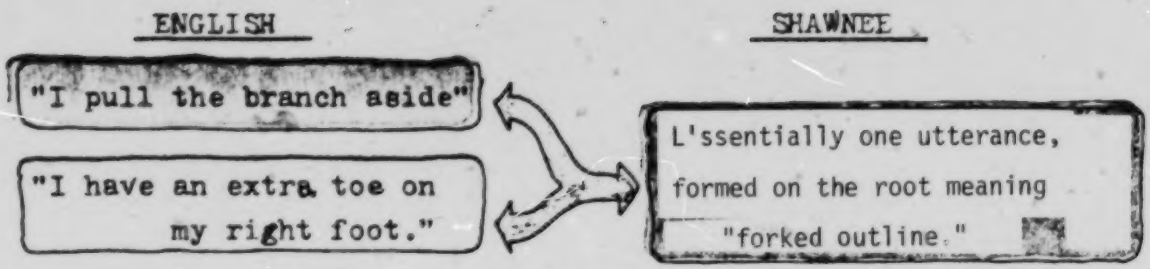
5. Shrinking electronics



6. Primitive translator

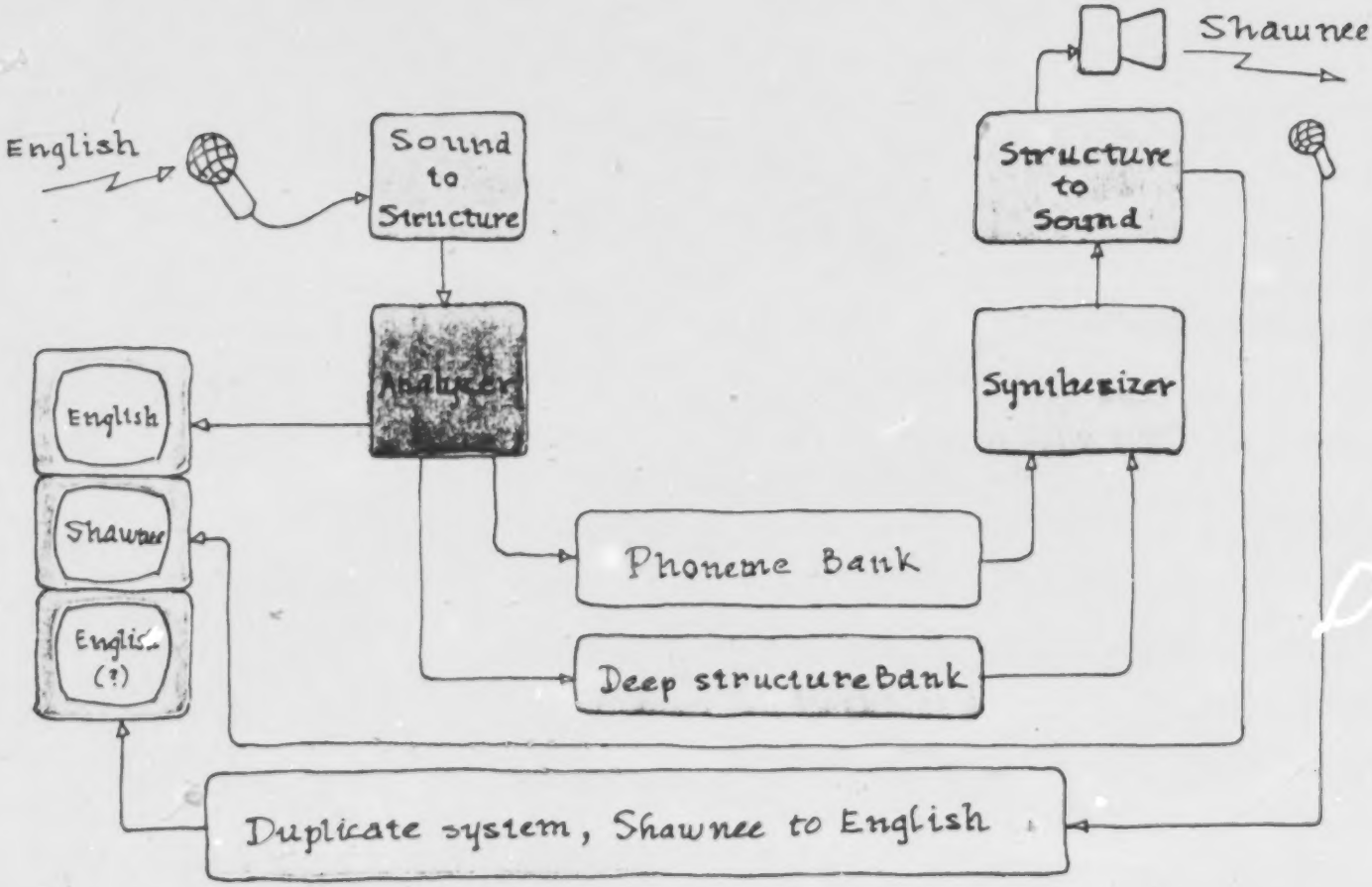


7. Now that's itty bitty

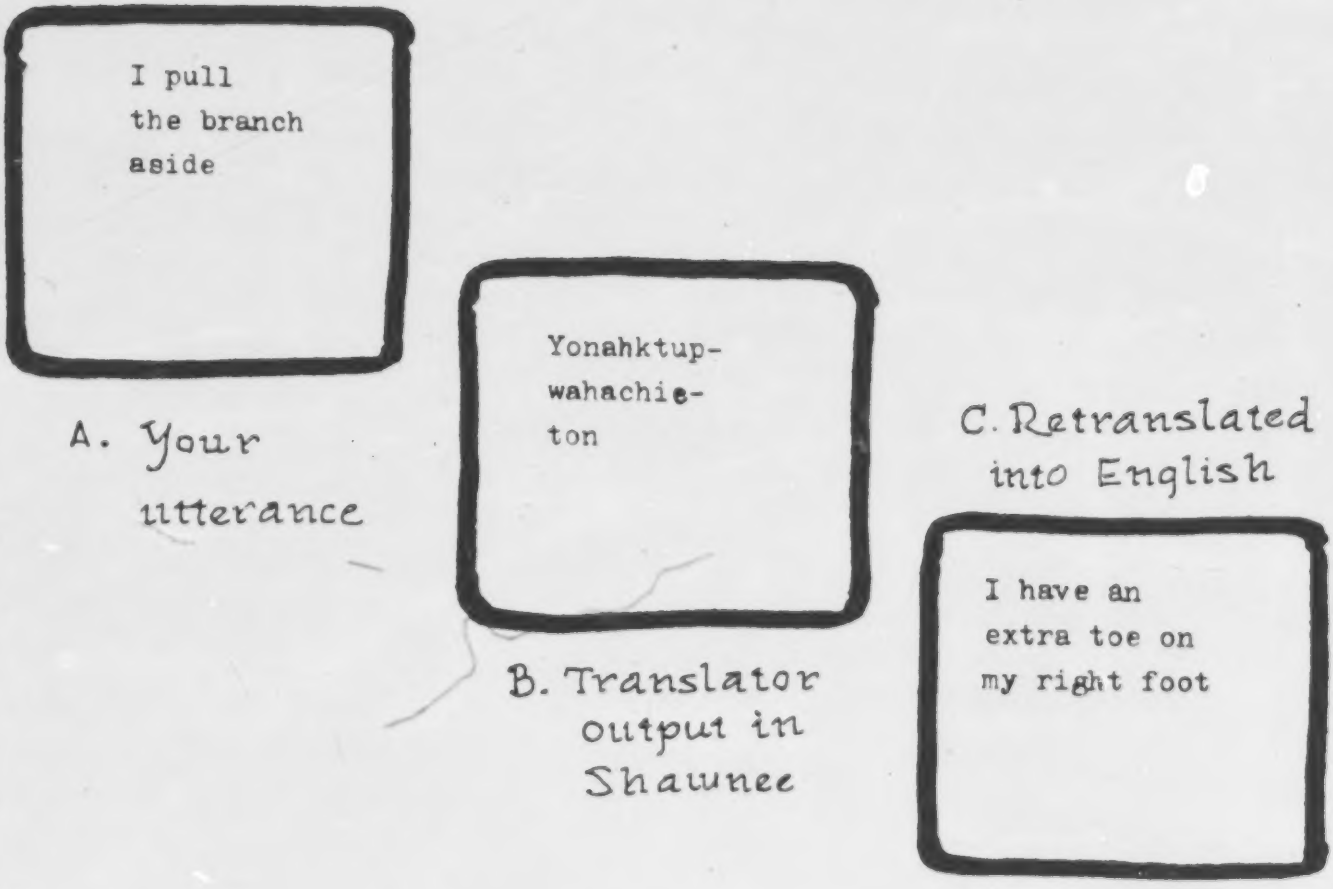

ENGLISH
SHAWNEE
"I pull the branch aside"
"I have an extra toe on my right foot."
L'ssentially one utterance, formed on the root meaning "forked outline."

MEANINGS

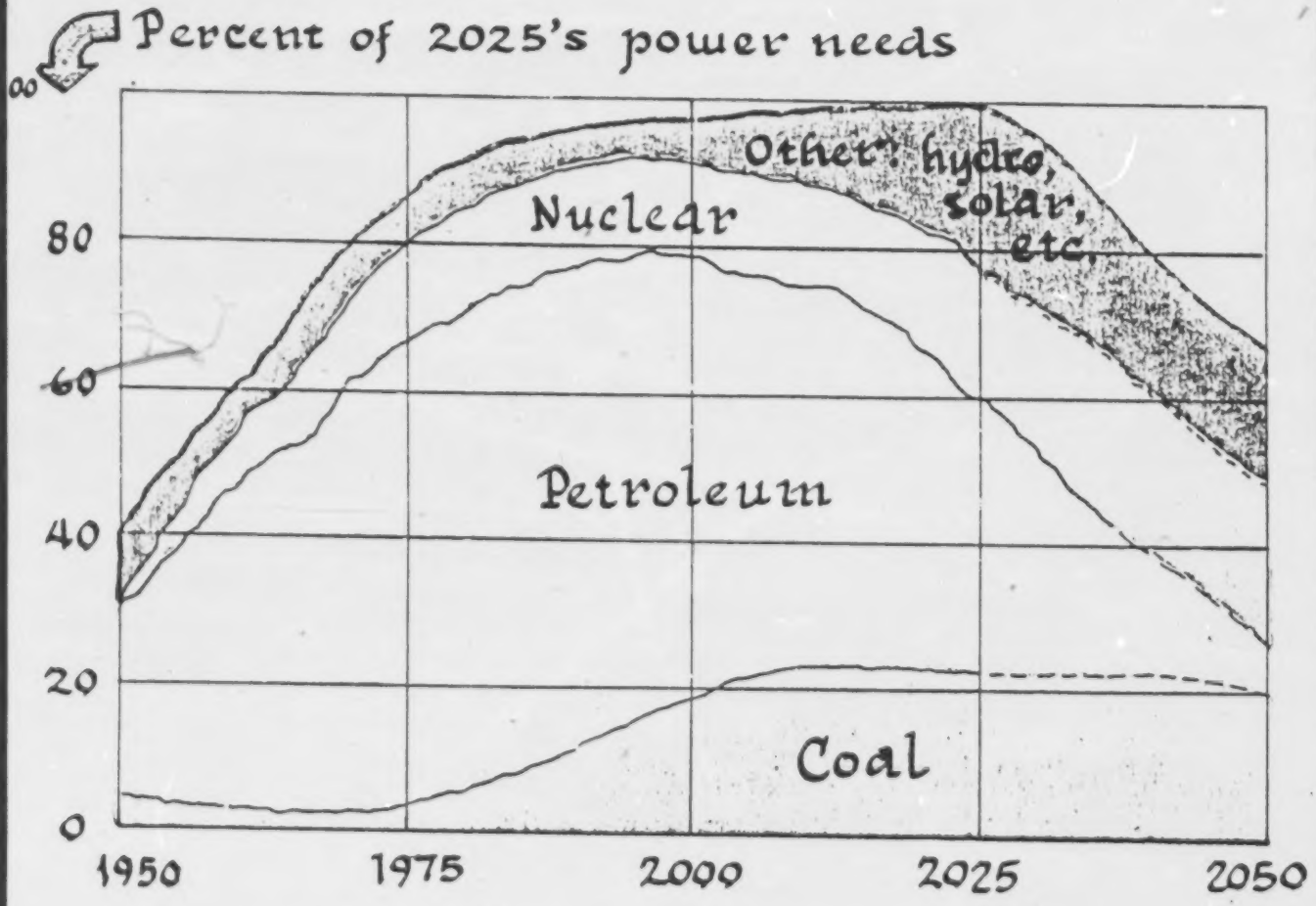
8. What did he say?



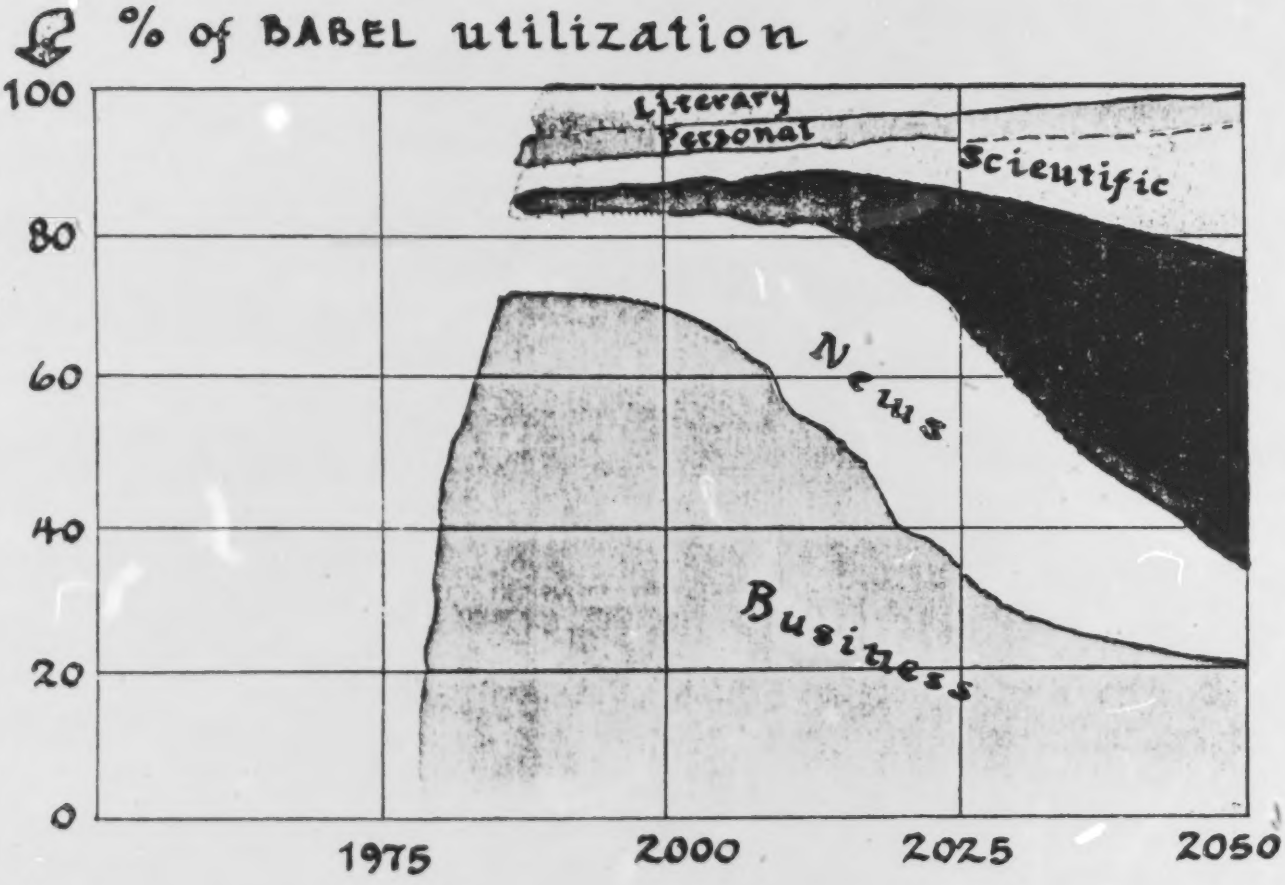
9. Modern translator


I pull the branch aside
A. Your utterance
Yonahktup-wahachie-ton
B. Translator output in Shawnee
C. Retranslated into English
I have an extra toe on my right foot

10. What did you say ?



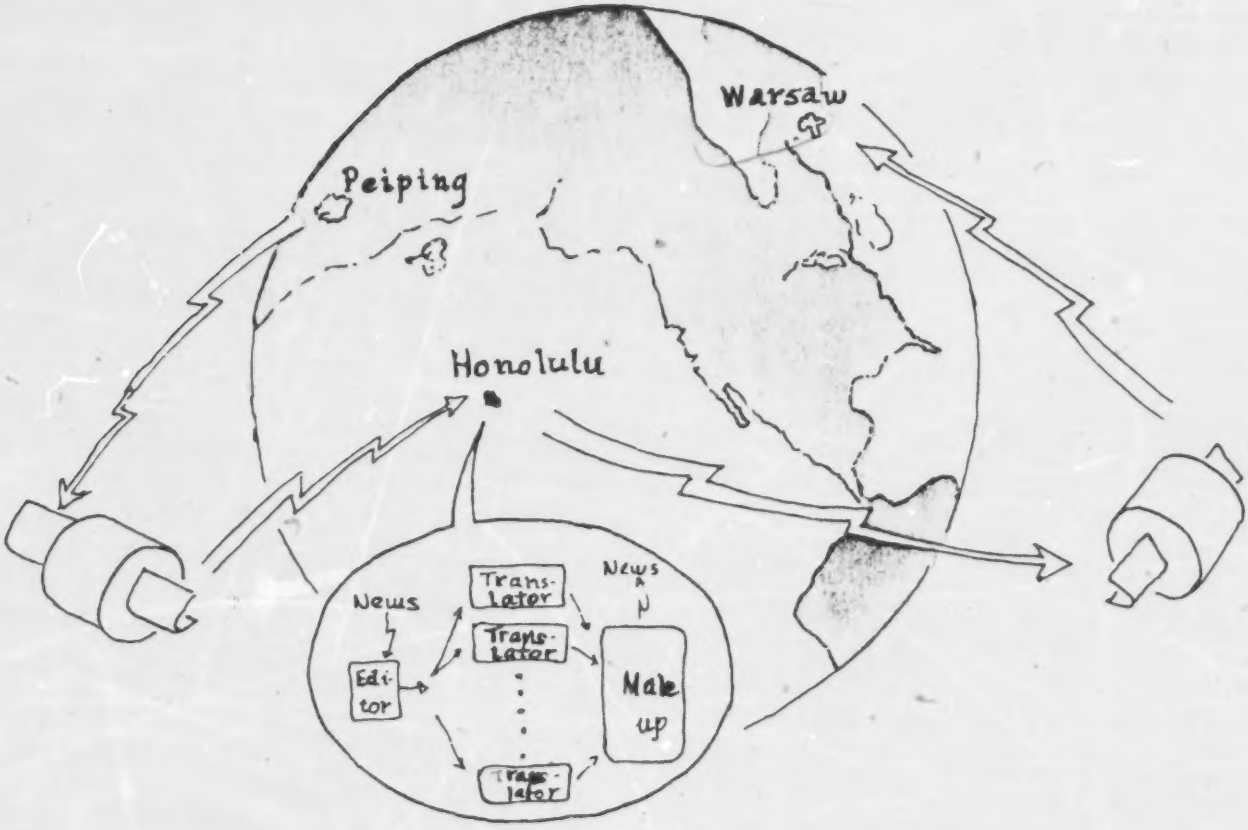
11. The lamps are going out



12. Whither do we tend?

13. News Use

58



14. Word to the world

PROGRAM #: CZ 17403

FROM: Dr. Charles W. Pierce, Director
Earth-History Interplanetary Communication Program

TO: Yerg Alkes, Liaison Officer
CESRA-3 Earth Study Commission

RE: Recent Historical Events and Trends in Earth-Based Communications, 1970 - 2020

PROGRAMMERS: Jan W. Huston
Joseph B. Rothstein

As you know, this is the last of a series of reports designed to give you some acquaintance with the facts of the Earth's social, scientific, and technological past. Since our original intergalactic contact in 1996 we have been building a basis for more productive communication between Earth and CESRA-3 through our Interplanetary Communication Programs.

In this report, we will discuss some of the major trends and events which have formed the basis for our transition to the present "Idiomergent Era". Our concept of the term may be understood by using the metaphor of the ancient process of joining together two sections of pipe or tube. Each section was threaded so that they could be screwed together, and the interface area was covered with molten metal - a process called "welding". Using this metaphor, the first section of pipe represents the previous Industrial Era, the second section of pipe represents the current Idiomergent Era, and the area where the two pipes are screwed together and welded represents the era of transition between them. This transitional era began in the early 1950's and continued through the mid-1980's. (All references are to the Earth calendar.)

The term "idiomergent" is taken from the Greek (an antiquarian language discussed in an earlier Linguistic History Report) - "idio", meaning uniqueness, and the Latin "mergere", to immerse or coalesce. Idiomergent, then, signifies the symbiotic interdependence of diverse and unique viewpoints.

The communications revolution was the pivotal element in the transition from the Industrial to the Idiomergent Era, from the standpoint of social theory and consciousness, as well as technologically. Many people in the early transitional years discounted

or rejected holistic and systemic perspectives, which are so typical today. Yet, despite the widespread anti-intellectual, anti-change, anti-transcendence and anti-systemic sentiments and factionalism that permeated the socio-political climate, the seedlings of the coming evolution were maturing: transistors, integrated circuits, microprocessors, the miniaturization of electronic components, the massive growth and extension of television and telephone networks, computers and satellites, all played increasingly important social roles.

The work of Dr. Murray Turoff on computer conferencing projects in the late 1970's contributed to a social climate in which individuals could fulfill themselves through their work, talent, intelligence, or entertainment, despite barriers of education, economic base, physical handicap, travel restrictions, age or past discrimination. The state of Hawaii, one of Earth's most physically isolated smaller land masses, became a planetary center for information storage and exchange, entertainment and the arts, and economic planning.

This associated development and technology, more than any other, planted the primary seeds of massive structural, organizational, social, political and economic change in the transition from the earlier Industrial Age and was the pivotal element in the transition to the present Idiomergent Era. Computer conferencing was in fact what brought about the recognition of what lay ahead of the turmoil produced by the wrenching changes that characterized the end of the Industrial Era and the transition to the Idiomergent. This innovation in its time frame could be seen as having a similar impact as the period when when Henry Ford started mass merchandising assembly line automobiles. (See Economic History Report, Vol. 6.) It surely must have been equally hard in both eras to get people to begin to appreciate the significance of such a new, but fundamental technology. Not until the mid-1980's, when heavy mass merchandising of low cost home information and entertainment centers became widely popular, did the public-at-large absorb the capacity and capability which they now had at their fingertips, particularly since it quickly became available in their homes.

Even the cable industry, which was preoccupied with two-way video capabilities and fiber optics, and touting the added benefits of video storage and wall TVs, was unprepared for the extent of the subsequent demand for the services and applications related to computer conferencing and the associated data networks. With the convergence of the marketing of low cost home terminals and home-user oriented software, data network companies were able to lease cable TV channels to act as nodes or ports. Subsequently, these developed into radically new mass-oriented electronic information services and exchanges, that had been previously solely the domain of business.

These factors were intensified by the energy crisis which occurred during this same period. This in turn intensified the debate over the issue of communication and transportation trade-offs. Contributing further to the search for new consensus solutions were the issues of privacy raised decades earlier in a future scenario in 1984, by George Orwell. All these concurrent problems brought about the outcry for and extension of the rights and services associated with communication. Thus, the energy crisis and its associated problems indirectly aided in the recognition of the desirability of a graphic feedback system for widespread co-operative exchange of information, while monitoring data files, facilitating individual negotiations for accessibility of one computer to others, and notification of rights to challenge or limit entry.

Moreover, it was computer conferencing and the accerelerated growth of data networks that heightened the awareness of the cost benefits to be derived from the communication and transporation trade-off that in turn gave new and strong impetus to corporate and governmental decentralization on a large scale. And it was these events which further demonstrated the value and desirability of collective intelligence in the decision-making process. Finally, collective intelligence, computer conferencing and data networks were the key ingredients in turning the corner toward the cybernetic systems we were to see at the end of the large 1980's. Collective intelligence also contributed to the solutions of the 1984 privacy issues.

The major obstacle to these developments was the big labor unions. By the early 1980's, they had reached a high watermark both in their influence on the existing power structures and institutions, and their increased resistance to change in the status quo. Changes in the type of work,work patterns, and areas of emphasis led to a labor union coalition for solidarity, fearfully anticipating massive changes in traditional union leadership and power. This resistance was overcome by making use of the capabilities of the home-based terminal network on a wide scale. Through the widespread use of a variety of interactive educational programs, transmitted over cable-TV, it was possible to inform the public of superior alternatives in the approach to work, as well as offering means to self-fulfillment through endeavors other than work.

An example of the new possibilities for self-actualization brought about by the new communications technology was the early marketable version of biofeedback music. In this early system, biofeedback equipment was connected by computer inferface to analog sound synthesis equipment, enabling the user to create, personally and immediately, music matched not only to his conscious

mood, but to his physical and brainwave activity. This drastic change in the relationship between art and the maker/consumer of art led to new modes of personal and interpersonal communication, culminating in 1989 with the development of the first colorized visual language. This was the consummate form of subjective behavioralism.

By 1985 hardware and software accessibility and capability enabled anyone to personally develop libraries of totally individual mood-personality music and visual images, as well as sound and visual images designed primarily for interpersonal use; regardless of musical background, knowledge or skills each person was able to enrich the lives of himself and others - a privilege previously reserved for only a few.

The year 1982 saw major trends emerging in both the technical area and the social service area. Holography had made a breakthrough in the economical production of film. Consequently, this opened up commercial and art applications throughout the balance of the eighties. However, the low cost mass merchandising of the equipment for production did not materialize until the mid-1990's.

More important in the same year was the next in a series of revolutions in the electronics industry resulting from the economic development of integrated optics. With the capability for substantially expanding the capacity of hardware to process information and store it, the industry was able once again to experience a quantum leap forward in miniaturization and thus capacity.

The trends of social impact of this technology on the 1980's were beginning to emerge. Most notable was rapid expansion of the software industry for both home and business utility of computers, and the video production industry. The United States made great economic gains during that decade as a result of the opening of these markets. The corresponding expansion of cable-TV and data networks complimented these software developments, and in particular those related to home shopping systems and electronic mail delivery. These two items were major elements in the heightening of consciousness of the lifestyle changes occurring on a nationwide scale.

The year 1983 stands out as one of those rare, earthshaking paradoxical events such as Hiroshima (discussed in an ealier report). Terrorists exploded a nuclear device in a heavily populated region of Iran. The world was stunned and virtually stood still awaiting the repercussions.

The U.N. met quickly in special session, seeking to establish safeguards against such terrorism. More importantly, at the same time, another conference initiated by the U.S., was convened to establish a new data communication network, to be based upon value-

oriented modeling and simulation. This idea had been progressing since the mid-1970's. At that time, it was realized that the major obstacle toward extended and prolonged stable world order - the prerequisite to expanded world development and prosperity - was the establishment of a system whereby every country developed a computerized model of its value system in terms of culture, heritage, expectations, fears, priorities, perceived rights, and needs. These models were then exchanged with each country with whom there was significant interaction. Upon exchange, these models would be examined for the various points contained in the other models to determine jointly: 1) the areas of total compatibility, 2) areas that were unclear or previously misunderstood, 3) mechanisms for dealing with areas considered to be of potential conflict, and 4) weighings that were mutually acceptable for each area. This facilitated accurate advance estimates of probable responses and perspectives on issues of national and global actions and interaction, through simulation and forecasting based upon these models. These models were exchanged as many times as deemed necessary by the parties involved until a clear understanding had been reached, and then updated on an annual basis.

This led in 1985 to the establishment of an ongoing International World Order Computerized Conference. Over the course of time this was to prove increasingly valuable in the reduction of world tension, hostility and problem solving. At the same time this conference brought about increasing interaction and co-operation, along with the free flow of information and ideas, on previously unanticipated level and scale.

Of equal importance, as a positive spin-off of the terrorist action and the new world order conference, was that value-based modeling was simultaneously being tried internally, on a statewide and nationwide basis in the U.S. and other countries.

Overshadowed by these events, other developments were worthy of note that year. Of particular interest were the increase in the number and diversity of home delivered social services, health and medical information and services, direct on-line library access, newspapers and journals, along with the low cost mass merchandising of home video recording and storage capabilities. The outstanding technical breakthrough of that year was the development of plasma materials. This was particularly important in the subsequent development of the flat wall screen TVs, and eventually the capacity for virtual storage of information for computer memory.

As had been anticipated, 1984 marked the apex of the debate on big brotherism and privay issues. What was somewhat surprising was the emphasis upon technological do's and don'ts rather than

myopic diatribes against the government. Of further interest was the positive impact upon this debate that the predicted worsening of the energy crisis was to play, specifically, the internal schism that occurred in the environmental movement. Environmentalists found themselves in two major camps, of which the larger were those who supported the positive benefits achieved through thoughtful utilization of communication and information technologies, vis-a-vis the communication and transportation trade-offs. The influence of this group carried tremendous weight in swaying the general public from abject negativism to an attitude of thoughtful consideration of the issues.

The concluding year of the first major stage of transition, 1985, most typified the paradoxical situation that echoed through the past thirty years in the decline of the industrial era and associated lifestyles, while heralding the shifting of gears to the upcoming decade and its new lifestyles, which were to be characteristic of our impending passage into the Idiomergent Era.

There was still a great deal of attention being focused on the Orwellian issues in the socio-political arena. This debate was to be enhanced by the exciting breakthrough in plasma application to computer virtual storage. The possibilities seemed endless, especially in light of the impact this would have on artificial intelligence capabilities and the enhancement of clever data networks which functioned like a modern-day Tree of Knowledge, of both ideas and means to wealth, home and office low-cost robots especially insofar as robots were within the price range of most middle class families already and the introduction of voice activated typewriters and keyboards. Thus, each of these developments, while expanding the Orwellian debate, was simultaneously indicating the remarkable social and economic adjustments and shifts that radically altered the work and lifestyles of the human race.

Thus, it developed that virtually everyone had an unthought-of abundance of skill, knowledge, and sophisticated technological tools and in particular, communication, information storage and computing capabilities for large scale interaction, services, and problem solving. This was further fueled by a collective view of an immensely expanding horizon of expectations and possibilities.

Two distinct global forces, then, shifted social consciousness toward the welding together of the two eras. The first factor was the mass realization of the capacity for the extension of services, aid, and thus, advancement to other lesser-developed socio-economic regions. In effect, we as a society were becoming collective evangelists for the fruits of communication capabilities, to the extent that many saw it as a unilateral panacea to problems.

The second force was massive world climatic shifts and the resultant food shortage. This was a call to arms for those supportive to communication and feedback systems, and speeded their extension into these lesser-developed, troubled regions. Attention shifted toward the rapid transfer of information, skills, knowledge and expertise in an attempt at global crisis avoidance. This concerned public shift in consciousness and emphasis was a reflection of the demographic bubble produced by the post-war baby boom, a generation which early developed social consciousness and awareness of technological possibilities. Moreover, it was an inherent challenge, both internally and externally, to help those less fortunate while simultaneously protecting the investment in the future, with the symbol of the year 2000 as a watershed for civilization. These developments and changes in attitude brought about the joining together of self-interest to national and global interests, in a non-military manner.

The second stage of our modern evolution, as we moved closer to the Idiomergent Era, can be marked as the period of time between 1985 and the year 2000, as indicated earlier in this document. This period set the tone, style and orientation of all social evolution since. As mentioned earlier, we entered this period with a rapdily growing awareness of the capabilities of communication.

In the United States, technological wizardry was accelerating its diversity and social diffusion, with one notable exception. Perhaps the single most significant harbinger of communications technology for over a century, the telephone, had become obsolete and was replaced by voice-activated terminal networks. By 1987, the shifting world climatic problems were exacerbating international tensions.

The following year, significant breakthroughs were made in genetic engineering. The ability to reconstitute cellulose and thus make it digestible also made it possible to turn grass, trees, bushes and shrubs into an abundant food supply. Designs for conversion plants were begun immediately. No sooner had this announcement come, when similar announcements were made of breakthroughs in the engineering of microbes that could desalinate water, and the ability to genetically increase the yield of most staple crops by 75% without the need for fertilizer.

In addition, the first space colony-factory, L-5, became operational. This was to demonstrate the ability of 10,000 people to live a full existence in space; producing food supplies hydroponically and making viable economic progress by producing electronic parts from materials mined on the Moon. Another development of 1988 was the compact micro-video storage capability. This marked the beginning of the end of printed paper products and services, while at the same

time indicating the worldwide potential for massive transfer of, and instant access to, information, ideas and knowledge of an unprecedented magnitude and wide-ranging implications.

The decade of the nineties introduced us to many of the major issues of the 21st century. It produced the knowledge, component technology and the necessary atmosphere for the launching of work on teleporatation. An equal amount of euphoria and enthusiasm was evident throughout the United States and the majority of the world at that time. As privacy and big brotherism were the issues of major concern in the eighties, genetic engineering became an issue in the nineties. This point was brought home in 1990, when it was announced that a breakthrough had been made in the ability to genetically alter the aging process, substantially eradicate disease, create new human organs, and in fact perform cloning. Thus, in one broad brush stroke, the world had seemingly stepped across the threshold of all theism and into the potential of Huxley's "Brave New World". Needless to say the debates were vigorous and vituperative even in comparison to previous such issues as abortion, birth control, euphanasia, privacy, and the environment.

At the same time our theoretical knowledge of blackholes in space had advanced, giving the desirable indications that the characteristics noted by Dr. Roy Kerr (who in 1963 incorporated fast rotation into the theory of blackholes and who produced the so-called "Kerr Solution to Einstein's 1916 Equations of General Theory of Relativity" that foretold of the possibility of instantaneous communication and travel as a consequence). Specifically, this meant that the potential for man to create blackholes to facilitate such endeavors in the future was very real. Mini-phasers and communicators, once depicted in science-fiction, rapidly became the technical rage, while home computer terminals were now being commonplace appliances.

Massive shifts in social lifestyles and the types of work performed continued through 1992. Physical labor was being phased out, and was expected to be ended within the next ten to fifteen years. Life-long continuing education, the evolving color-based language, the centralizing of primary work patterns and information around computer conferencing and clever data networks; and the burgeoning of the new rural America as a result of refined means of combining communication with the idiomergent element in such a way that they renewed the concept of the extended family, yet placed unprecedented emphasis on independent individuality.

The only element standing in the way of further global advancement was the still-unresolved energy crisis. Despite the propaganda put out by the energy industry over the previous two decades, 1993 saw an international joint effort to establish an orbital solar energy collector (a spin-off of the value-based modeling and simulation It was now feasible, and economically desirable, to microwave limitless energy to all areas of the globe, and to be operational by 1995. Not since the end of World War II were there so many expressions of relief by so many people in so many different regions of the world.

In the following year, 1994, the privacy issue of the previous decade had subsided, and other issues became permanent. Computers of the capacity of the IBM 360 class of the 1970's were now available in units the size of a thumb. LSI technology for self-programming of computer software requirements was becoming commonplace. The post office by 1994 handled only 10% of the work they had a decade earlier. Only one of ten secretarial positions that existed in the late 1970's and early 1980's was still required; even those positions were expected to be gone by the end of the century. Ninety percent of the newspapers and journals had been supplanted by electronic delivery. The work week had by this time been reduced to three days, each ten hours long, with at least two of those days spent working at home at remote communicating work stations.

The announcement of large scale efforts on cybernetic systems for use in both government and the corporate world was made in 1996. In fact, the United States announced that it was developing a computer system called "Millennium", with all significant data bases and networks, both domestically and internationally, on-line. Further, contained in its memory, this system would have the equivalent of information storage and processing at a Ph.D. level of learning for every field of endeavor.

However, two other events that year later overshadowed this development. The lesser event was the low cost mass merchandising of holographic equipment for the business and leisure market. Its major significance lay in its subtle effects, which were at first perceived as novel and innocuous, somewhat reminiscent of the way television was first perceived. As in the case of TV, holography on a large scale was to prove a leap forward in social and personal consciousness. It gave people a totally new perception and new meanings of the concepts of space, time and reality itself. Everything we had been conditioned to recognize visually - even human beings - could be holographs. Thus, our understanding of physical objects, or asthetics of art, architecture and entertainment, could no longer be assumed as being geniune, real, or actually occupying a particular three-dimensional location at any particular given moment of time. Thus, all of those traditional tangible properties - which are in effect what we collectively call reality -

could be an image or illusion. This had a struggling impact on the psyche of most people and in particular the elderly and those with a mind-set of status quo.

All of these events were overshadowed on November 29, 1996 when initial contact was made with a particular galactic civilization, CESRA-3, approximately eleven light years away. With this report we are at the end of the first stage in establishing a basis for communicating and understanding between Earth and CESRA-3, after this twenty-four year program.

The years 1997 - 1999 represented prosperous and satisfying times for our civilization. Earth culture was the final transition to the Ideiomergent Era. The Millennium system began operations in 1999 - the first experiment with a multi-national cybernetic system that linked together collective and artificial intelligence in a symbiotic relationship for management, and decision-making assistance, on an unprecedented scale.

The year 2000 was spent in Earth-wide celebration. The world over, people celebrated civilization's triumph over hunger, war and successful transition, and looked forward to worth-while communications with other civilizations.

In many ways, the changes and advancements in these first twenty years since the turn of the century pale in comparison to the last twenty or more years of the 20th century. This is not to say that the modern renaissance which characterizes the 21st century, the productive industry of artisans and craftsmen which now exists, or the scientific horizons we have before us both here on Earth and the Earth II colonies - are of any lesser importance. Rather, it is that these last twenty years have represented the refinement and fruition of the seeds of change planted during the epoch which preceded it.

This concludes our series of interactive self-education programs designed to give the civilization of CESRA-3 a fundamental understanding of Earth culture. Meanwhile, we are making a similar effort to learn about the history and culture of CESRA-3.

We look forward to the benefits which will certainly come to both our civilizations as a result of our understanding and collaboration. We of Earth feel confident that the beginnings of interaction with extraterrestrials will be viewed in retrospect as a step forward equal to any of the previous century.

HAWAII INTERISLAND COMMUNICATION: A Typical Day

Ronald N. S. Ho

Since the discovery of the vacuum tube and transistor more than 50 years ago, communications technology has advanced so rapidly that it has affected everyone in this year 2020. As you recall, vacuum tubes first gave way to bipolar transistors, which were succeeded by field effect devices, charge coupled devices, and finally by our present-day pure electro-magnetic domains. With each new era of devices, inventions and innovative designs were made possible. Today these new designs play an important role in the daily life of everyone such as it does in the Smith family who live in Koloa, Kauai.

At 6:00 a.m. every workday, Mr. and Mrs. Smith are awakened by their telecom set (T.C.). The T.C. awakes them with soothing music followed by the news events of the day, weather conditions, interisland traffic conditions, business conditions and their choice of a topic of interest for the day. These broadcasts are transmitted to any room in the Smith's home from one of the many comm-relay stations that are situated all over the State of Hawaii. In addition, the comm-relay stations are ultimately tied into a central control on the island of Oahu. Moreover, the pre-recorded broadcasts are updated every 30 minutes and are ready for release to any locality in the State of Hawaii or to any other place in the world.

After breakfast, Mr. Smith walks with his children to the nearest rapid transit terminal 200 meters away. There, the electronically operated people mover takes the children to school and Mr. Smith to his mini-office which is 5 kilometers away. Their fare is $1 each and is charged automatically to a central accounting office in Honolulu. Their ride is enhanced by the doppler brake system and the comfortable air rail system. Adding to the convenience and comfort is the automatic transmission of safety and traffic precautions to the central control where the safest and most cost-effective route is selected. Redundant safety systems have been incorporated into all vehicles, so accidents and delays are reduced to one percent of that of the 1990's. Only five minutes have passed and the children are already at school and Mr. Smith has reached his office.

In his office, Mr. Smith turns on his T.C. and reviews business happenings at other branch mini-offices on Maui, Oahu, Hawaii, Los Angeles, San Francisco and San Diego. As director of sales for "Amalgamated Controls" (A.C.), manufacturers of replacement modules for all types of telecommunication sets, Mr. Smith directs a work force

of 40 people in the geographical areas of his region. A.C. manufactures BITE (Build In Test Equipment) and LSI repair modules for 14 types of T.C. sets. Since the advent of ion implantation, multi-level gates and advance lithography, production cost of large silicon wafers has decreased to a level where it is cost-effective to discard bad portions of the T.C. set and replace them with spare modules. It is now common practice for each family to stock several spare modules just as a family often stocked spare flashlight batteries during the pre-2000 years.

Mr. Smith finds that today his services are required to demonstrate his products and negotiate a deal at Waianae, Oahu. Like other months Mr. Smith travels about eight times a month between Kauai and other islands. After having set his appointment for one hour later, Mr. Smith makes a reservation via his T.C. for the next available flight and is charged in the same way that his rapid transit fare was processed. He boards the rapid transit which takes him 10 minutes to the airport and a few more minutes before he arrives on Oahu from Kauai.

Due to the heavy air traffic between islands and between Honolulu, continental U.S. and the Orient, air traffic control has evolved from the third generation equipment of the 1970's to the present-day sixth generation equipment of the 2020's. Air safety has long been a major issue and companies such as TRW, Rockwell International. LTV and others have developed spread-spectrum air traffic control communications equipment to accommodate the 10,000,000+ aircraft now existing in the United States. Standard pre-recorded messages such as altitude, location, bearing, weather conditions, speed, etc. are automatically transmitted between aircraft and ground control. This information is fed to the aircrafts computer and informs the pilot of all necessary communication, navigation, surveillance, and identification functions that are required. Because of the increased transmission of pre-recorded messages, air traffic controllers now have an easier time controlling a greater number of aircraft with a higher degree of accuracy.

The aircraft lands and Mr. Smith boards the rapid transit vehicle and is on his way to Waianae. While passing the Antenna Farm in Nanakuli, he recalls all the commotion during the planning of the project and now reflects on all the benefits of this new facility. The sun's energy is captured on a 7 square kilometer expandable antenna collector system that is in a geo-stationary orbit above Oahu and power is transmitted down via microwaves to the antenna farm where it is collected via the many antennae and stored and transmitted inter and intra island. During the 70's, 80's and 90's, the cost of fuel rose such that solar energy projects such as this one became economically feasible. Now Hawaiian Electric owns and maintains all the microwave power links between islands and the antenna farm with the storage facility at Nanakuli.

In a few minutes, Mr. Smith arrives at his meeting, 10 minutes before his appointment. He looks at the country side and reflects. Unlike the 20th century, there is no "Center of Business" areas. Land became scarce and communications and transportation improved remarkably. Presently, most business is done via tele-communication between mini offices throughout the State. Even the need for privately owned automobiles had decreased because it was no longer needed to commute. Small offices in less costly land areas became more economical because solar technology made heating and cooling possible for total building systems, therefore density per dollar was no longer a good argument for high rise in very expensive land areas.

As Mr. Smith enters the building, he notices the building's antenna system which was incorporated into the architecture of the roof. The antenna is almost totally concealed yet provides a stearable beam width of 40^{0} and a gain of 35 db. The building communication system is in direct contact with public protection agencies (e.g. the police department, fire department) and financial and business institutions. Due to the innovative electrical and electronic design of the building communication system, security is totally automatic.

Mr. Smith's meeting goes well and a deal is made to supply $15,000,000 worth of replacement modules and BITE to Mr. Jones, the owner of a distribution company. Mr. Jones contacts his bank via T.C. and makes the arrangements for the loan. Arrangements are made to deposit $3,000,000 to the "Amalgamated Controls" (A.C.) account the next day when 20 percent shipment is made to Mr. Jones's warehouse. Mr. Smith contacts his factories in Honolulu, San Diego, and Los Angeles, and arranges to ship the 20 percent that day so that it will arrive the next day at Mr. Jones's warehouse. All of this business has transpired without their having to leave the mini-office in Waianae. With both parties being satisfied with the deal, they head towards Kahuku for lunch.

As they past Haleiwa, they pass another Hawaiian Electric facility, the peak-demand-communication facility which monitors Kilowatt demand of all the County, State and Federal facilities via microwave links. Should demand exceed some threshold level, pre-determined, less critical systems are turned off momentarily. By controlling demand, unnecessary large stand-by power equipment can be eliminated and a lower rate can be offered to these consenting organizations. The system has worked well and has reduced government power spending by 20 percent. HECO benefits also by not having to provide equipment strictly for standby or excess demand peaks. These funds can be turned to more productive areas where revenue for new customers can be received.

After lunch, Mr. Smith departs to visit his Honolulu office and later he returns to his family on Kauai. On the way to the airport, Mr. Smith receives a call from his wife on his personal communicator. With charge couple devices (CCD) and high density batteries being very common, visual telephone (televise) via microwaves became a reality by 2000. Everyone now walks about with their personal televise sets. New techniques to generate psuedo random sequences provided the basis for addressing more than 1,000,000 individuals. In a regional area, these with area codes provide the basis for addressing anyone in a regional area or via central control to anyone in continental U.S. (CONUS). Advanced antenna technology made possible lightweight antennae that could be concealed in a belt or in a hat. Self charging batteries powered by piezzo electric crystals were found sufficient to power personal televise sets indefinitely. These batteries are charged via pressure generated between the shoe and the floor whenever a person walks. It was with this handy device that Mrs. Smith informed her husband about a dinner picnic to be held as soon as he arrived in Kauai.

While on the flight back, he ponders on all the telecommunication devices that affect his everyday life. Technology and the general acceptance of modern telecommunication has made life more enjoyable, provided better channels for communication between people, and certainly simplified the techniques of conducting business; thus leaving more time for the family or other pleasures.

The above future scenario is purely fictional at this point here in 1977, but who is to say it cannot happen.

As computers and communication become closely integrated, there is no limit to what can be done to make our society a better one. Device speeds that are now in the micro second will undoubtedly advance to nano second (10^{-9}) and to the pico second (10^{-12}). With higher speed devices, access time for memories and wider band width for communication equipment will certainly increase. This means more data can be accessed in a shorter time, and more channels will be available due to more spectrum availability. Invariably as device density had increased more than 100 times during the past 30 years, 1947-1977, it may be possible to also increase another 100 times in the next 40 years. This means more functions can be designed into smaller space and combined with new production techniques, the communication future certainly looks promising and most certainly will affect just about everyone. Who is to say that everyone cannot have a two way communicator (televise) in his pocket, with his belt or hat as an antenna, and a self-powered pressure battery in his shoe. Or who is to say that telecommunication cannot reduce air traffic fatalities, or reduce power rates, or help conserve enery, or minimize security risks, or reduce vehicle traffic accidents, or control pollution or keep anyone informed of world news events in the year 2020?

COMMUNICATION AT THE MAUI CENTER

Harold E. Barron

Eddie, a twelve year old, ran into his house calling to his mother; "Hey Mom, today we turned in our Health game cards and started on the Safety group."

"So you've been to the Communication Center. Did you see your father? He is there to give a talk to youngsters on alcohol abuse."

"No, I didn't see Dad and the worker asked how many were changing over from what she called junk cereals to granola and bran and wheat germ and fruit. And, Mom, every one of the kids in my grade raised their hands."

"That's a good sign and there will be a lot less of that awful colon cancer when you youngsters grow up. I'll bet that poster of the alimentary canal barge helped them decided to eat better breakfast food."

Eddie thought for a minute and then remembered, "Oh, yes, that was the picture of two barges on schedule through the canal. One showed a donkey pulling barge on which there were all sorts of bad contraptions and showing the schedule of 70 to over a hundred hours for passage."

"That's the one and the other barge showing what a doctor discovered in comparisons of English and African tribe diets. The second barge was a speedy one that made the trip in about 35 hours and was on schedule usually twice a day. It had on board in huge quantities, granola, wheat bran, wheat germ, fruit and Yogurt. It also showed charts with crossed out ailments such as constipation, diverticulitis, appendicitis and cancer of colon."

"Well, Eddie, what do you remember about those Health game questions that our family has put into practice?

"That's easy, number one was about losing weight with fewer calories with sweets. It said that honey is the answer -- it contains more protein and fewer calories. Some of the other stuff I don't remember, but it helped Sis lose weight."

"Yes, son, it told about honey with more phosphorous, sodium and potassium than sugar according to a U.S.D.A. Handbook. Also Dr. Bloomfield, an English doctor, has been using honey to promote healing of ulcers and burns by applying it every two or three days under a dry dressing."

"That number three reminded me that I'd rather not have to wear dentures later on and to stock up on dolomite and bone meal tablets for their calcium."

"You can be thankful that your Dad used plenty of bone meal tablets to get through those four falls without any breaks or even bruises. I'm wondering about those celebrities who fall and break bones on stage like Marlene Dietrich and Dan Daily back in 1977, whether they had their share of dolomite or bone meal."

"Speaking of celebrities, there was a Senator and that famous Presly back then who could have profited by knowing about the fast schedule through the alimentary canal."

"Here comes your Dad now. I understand he's talking to youngsters your age, since 13 years olds are beginning to start drinking and having problems."

"Hi, Dad, I didn't get to your talk but I sent a couple of my friends who needed to hear about your subject."

"I know, I saw your friends and they came up and thanked me afterwards. I think we caught them just in time. In the good old days we never had Communication Centers, we called them libraries where books were stacked and stayed for months and years without much use for some outstanding books even."

"Yes, Dad, and they didn't have all those printing presses turning out the cards and posters that have helped so many people including your father."

"You're right son, my 83 year old father wouldn't be here if we hadn't seen the health card about the skipping exercises from the Total Fitness book by that fellow from U.C.L.A. His peripheral neuropathy, a nerve ailment, doesn't permit him to jog or do other strenuous exercise; but he lowered his pulse rate from 80 to 60 by skipping while holding to a table to get his pulse up to 120 for a few minutes."

"And don't forget his eyesight and hearing. Those vitamins that he takes are like those of the over 70 year old physician in New York. He takes vitamin E for that congestive heart failure that the doctor didn't have and Vitamin C and A and lecithin and Brewer's Yeast which has so many trace minerals and amino acids as well as vitamins."

Future Communication

"How did all this new stuff with cards and charts start anyway during the days of libraries instead of communications centers Dad, do you know the history of the beginnings?"

"All I know is that one Probation Volunteer was having a heck of a time communicating with a school drop out. He knew about the high percentage of information absorbed by sight rather than the hearing so he contrived a game to help his probationer with questions and answers on the three-by-five cards."

"I get it, the probationer would read the question on one side and reading the answer would get the ideas that he wouldn't take in talking."

"Yes, son, and the family also benefited because the Probation Volunteer wanted the material to be for all the family so he could also help relatives back in California and the older people where he was corresponding secretary of the Retired Persons chapter."

"Your mother can be grateful he thought of older people too, because there's plenty of old material that helped her mother when she was showing signs of senility. Those B complex vitamins and that big line of other supplements including blackstrap molasses and Brewer's yeast certainly pulled her back to sensible behavior."

"Well, Bill is now at college, but I'd like to see him get his first job in a Communications Center especially for the Maturity and Money aspects."

"Dad, what's so important about the Maturity and Money aspects of the Center's output?"

"No matter what kind of business or even government job he takes later, he'll have a good foundation in how to handle himself and his money, too. That's what a lot of the officials get for their weekly perusal of material from the centers. Reports of cities and counties fiscal problems and how the most financially thriving accomplished what they did. They don't want any more New York City failures like back in the 70's.

"One of the workers talking to a Mother's group told us that some of the Union bosses really backed down from their strike ideas when they went over the cards on the Maturity section. Some of the former union actions seemed childish to the bosses after reading some late psychological findings. The savings are in the millions just in that one aspect.

"Speaking of loss of millions, Son, did you know that American business was losing over 100 million a year because of illegible scrawls of workers and executives. And how are they correcting this loss? Easy, the Maturity card says 'Slow down and make every letter carefully and connect your letters properly to make words.'"

"Why do you think this new Communications Center idea is so successful?"

"Well, after I gave my talk, I looked around in the back and noted the activities. They're all practically on the inexpensive side but using the high attention value materials. They're starting on some charts which will show ailments in one column and down the side the supplements of vitamins and foods that are scientifically proven helps for those conditions."

"For instance, I'm in the age of the men who get prostate troubles. So what am I going to start taking more of? There's Zinc and magnesium and bee pollen and, get this, pumpkin seeds. And no fooling, I'm going to add them for life because I know a man who had a prostate operation and a few years later had an even worse case which did some real blocking."

"Your sister, since she'll soon be starting to drive a car, should be getting those larger five by eight filing cards on Safety on the highway. Here's one that I think is very good. I'll let you read it."

Safe Driving. The frequent sightings of broken glass at the intersections, with police herding vehicles and people off the roadway, shout loudly that we're not all driving as civilized humans. Some of us are thinking that common practice makes it the right way.

Points that are ignored which could be of great value are consideration of news from efficiency experts, engineers, psychologists, police statistics and medical research.

Setting watches and clocks ten minutes or more ahead might take the rush out of getting from place to place, according to one efficiency executive. Experiments at proper speeds with knowledge of time-distance illusion could calm the driving attitude.

Thinking that a green light means "danger" is a good restraint on getting through a light-controlled intersection. Stop light phobia can be overcome with the foot poised over the brake pedal instead of on the accelerator.

We "irritate ourselves," say the new psychology writers, so a delay need not cause a neurotic reaction of roaring around a slower moving vehicle. This, incidently, raises the pulse rate according to experiments in England. Why increase the possibility of heart damage in daily stressful passing?

Perhaps some drivers need a little more courage to maintain speed limit driving against the prevalent traffic bullies. Some drivers, it appears, never look at the speedometer, so a good example might slow down overspeeders after they've passed.

We have to be less naive and trusting of the fellow drivers who aren't bent on looking after our safety. Many of us are concerned that we can't contribute money generously to all worthwhile national and local projects. Here is one project to which all drivers can contribute with little effort and consider with pride the reduced accident statistics.

The solicitations of citizens for sharing and betterment of family and community living brought into being some startling results. One older woman told of having been given a doctor's prescription for certain vitamins for which she paid $5 a bottle of thirty vitamins. After several months of paying this high price, she discovered the real name of the vitamin product hidden under the pharmacist's label. She knew a young man at the pharmacy and asked him to get a bottle for her. He brought out a bottle of one hundred of the vitamins for the same price for which she had been paying for only thirty. Needless to say that practice was stopped immediately by doctor and druggist.

Another woman gave a particularly important contribution in Hawaii, where according to statistics, we have the greatest number of people with breathing problems. She was induced to try an experiment with vitamin A that changed her life. She had not been able to sleep because of breathing problems. If she raised her legs off the floor, she couldn't breathe. Therefore, she would sit on a sofa with her head on a pillow on a T.V. table. Then she tried the stunt of cutting a couple of Vitamin A tablets, letting the oil run down each nostril. From that time on she has been getting a good night's sleep and also has started seeing a nutritionist to clear up not-so-good eating habits.

An older man also seemed to have demonstrated the good use of dolomite and bone meal tablets. As a youth he had not been a milk drinker and his bones were broken twice from a short fall and after diving at a football player in a pick-up game. At about age 76 he learned that a college classmate who had also been the head of the American Medical Association said that 90 percent of all deaths showed a calcium deficiency. He thereafter began copius intake of calcium via bone meal and dolomite. He was trying also earth shoes without heels and no rubber heels. He had four falls, three on hard surfaces and one on grass. In none of the falls did he experience the slightest pain or discomfort or swelling or any osteoporosis.

In an irate citizen type of response, the absurdity of granting subsidies to the tobacco industry while denying them to Hawaii's sugar growers was protested to the proper government authorities with some promises of further investigation.

The enormity of errors in mail service was uncovered when citizens provided evidence of magazines undelivered, checks lost, letters not received and overcharges by clerks. This information to the Postmaster General caused a shakeup in the ranks and better service.

Families were reunited after reading material in the many new books on marriage relationships. Paths to reconciliation were opened by the information proven successful in many experiments.

Blue collar crime was only stemmed with juvenile shop lifting when spiritual values were emphasized in the spiritual aspects of the Communication Centers. The projects seemed most difficult to get started by the teaching of moral values made a great difference when finally under good speed with many drivers toward better life routines.

Time utilization became an important subject with free lists for setting goals for a day, a week, a month, a year were offered. Some T.V. watching resulted in lost customers when choices were made for accomplishment versus entertainment. Daily priorities were easily selected when made out the night previous to a full days successful use of time.

Career opportunities were widely published so that youngsters could start thinking about what kind of work they would enjoy and thereby find most rewarding and successful.

Citizen protests were mainly responsible for changing practices in industry with many harmful additives. Protests sometimes took the form of letters and phone calls and often boycott of products with harmful or useless ingredients or simply full of non-nutritious calories.

The Communication Centers became the spots where the Heimlich maneuver and new resuscitation methods were popularly practiced by many citizens. Already popular, home gardening was greatly expanded by explicit demonstrations and shared seeds and shoots.

Parent Education Training was responsible for the great cut in teenage runaways and suicides. This was a method of using discussion and negotiation between parent and child to solve problems. The parent's need as well as the child's had to receive consideration.

The philosophies of present day celebrities were brought into play. For example, Sonny Bono's idea about failure was given. He says "The only time people really fail is when THEY stop. Failure is determined by the individual, not circumstances. You yourself decide when it's ended. If you don't agree with circumstances, believe me tenacity prevails."

The widespread use of eyeglasses was slowed when such books as DO YOU REALLY NEED EYEGLASSES became part of the Communications Centers concern. Palming and sunning of the eyes became almost as popular as jogging as exercises to be practiced daily for good eye health.

The proper kind of stamp collecting under money suggestions became even more popular when jump in values were explained in comparison with stocks and bonds.

Some parents eliminated entirely the T.V. from the home while others restricted T.V. watching only to weekends with no school work to be done. Grades immediately jumped in those family circles.

Neglected parents and grandparents with noncorresponding relatives were given new happiness when told how to send self-addressed, stamped envelopes and sheets with partly answered questions to the busy ones. Sometimes children were designated to be the letter-answering person with a minimum stipend for each letter written.

Neighbors were encouraged to share energy saving ideas around the home. Fewer cars were on the road because car pooling really became a necessity with the price of gasoline constantly rising. Accidents also were thus reduced.

Many lives were saved by the promulgation of the ideas and methods shown in the book on No Panic emergencies which covered even the way to help in childbirth.

It was especially important when the words of Dr. Roger J. Williams, widely known discoverer of pantothenic acid and author of many books and articles, were widely displayed and read. He said; "the general recognition (of value of nutrition) will come rapidly under one condition--when elementary education awakens to the vital reality that schools should teach youngsters WHAT THEY NEED TO KNOW IN ORDER TO LIVE HEALTHY LIVES."... "These facts of life should be common knowledge. They should be known by each youngster long before he or she goes to college.

"They should also be aware that just as the health and vigor of a plant depends on its getting a good supply of the chemicals plants need, so the health and vitality of their bodies depends on their external food supply of their essential body chemicals. These facts should ALL be regarded as elementary, and not at all revolutionary or astounding."

He also says,"It is a grave mistake to think of nutrients (vitamins etc.) as medicinal agents. They are not medicines at all; and they function in an entirely different way. Medicines and drugs interfere

with metabolism, nutrients MAKE METABOLISM POSSIBLE. Nutrients are the raw materials from which metabolic machinery is built. Life cannot exist without them."

Still other important words from his book are: "Vast human betterment, including substantial relief from coronary heart disease, mental retardation and other birth defects, arthritic disease, mental disease, alcoholism, dental disease, muscular dystrophy, multiple sclerosis, cataracts, glaucoma and many other diseases, including cancer, must await the day when nutrition comes alive and reaches out to new horizons."

One of the most controversial aspects of the Communications Center was the invitation for all religions and non-religions to meet at their spacious meeting hall to present, in time-limited talks, the benefits of their particular beliefs.

There were only a few who labeled themselves atheists and agnostics and demon worshipers, but they had their way with no great outpouring of followers. The most impressive seemed to be those called on to relate their back from death experiences as published in books and Readers' Digest articles.

These people seemed to receive the most rapt attention and the comments from others indicated that they were about to do some dramatic changes in their life routines. Others still doubted the reality of the experiences related and were not ready to take a giant step as it were into a different spiritual relationship.

Representatives from various religious rally type T.V. and radio programs read testimony of so-called miracles that had occurred as a result of their intervention with Christ. There seemed to be a great mixture of cross religions for example, Jewish persons who had accepted Christianity and the same for several nationalities such as Japanese and Chinese.

"Well, Dad, as I see it, you have an idea of getting hidden information out in the open for the benefit of everyone just as Dr. Roger Williams wants nutrition known by all elementary school children."

"As I see it and as Richard Barber and associates are trying to inspire many others to envision the new worlds of communication, we have to take advantage of every possible avenue of getting the important ideas of every kind across to the very people who need the ideas for their complete physical, mental, emotional and spiritual health. We must not let them be taken haphazardly by just a few.:

"Can you think of any subject that couldn't be covered in your methods of making digested material available to all sorts of people?"

"Well, maybe I wouldn't be very confident in trying to advise persons who want to go to the Moon or follow in the airways of the astronauts. But as my very respected American Association of Retired Persons says, We must share and that's the one thing I've tried to do."

A COMMUNICATION FUTURES GAME FOR HAWAII

Janet Harada

Scenarios 1975 - 2025: The Overall Pattern for Hawaii

1975 - 2000

KEY WORDS:	Dualities	Urban - Rural
	Explorations	Modern - Past
	Expansions	East - West
	Technical	Technical - Human
	Bureaucratic	Small - Large
	Passive	Natural - Artificial

2000 - 2005

KEY WORDS:	Crises	Land and Ocean Turmoil
	Turmoil	Islands Change
	Evaluations	Life Survival
	Challenges	Values and Perspective Change
	Values	
	Humanistic	
	Basics	
	Forced Action	

2005 - 2025

KEY WORDS:	Centered Living	Three Ways of Living
	Applications	Nature Oriented
	Combinations	Technical Oriented
	Life Expansions	World Oriented
	Selections	Choices and Actions
	Active Workers	Centering and Development

Description of Hawaii in 1975 - 2000

Today's pattern of duality, exploration, expansion and bureaucracies will continue. Hawaii will have both the East and West influence, both modern orientations and past orientations, both technical and nontechnical interests, both large organizations and family units, both natural and artificial emphases, and both personal and organizational interests. These are but a few dualities evident in Hawaii today. These will continue to be explored and some expanded. Technology, large organizations, personal material goods and pleasures will be emphasized.

Description of Hawaii in 2000 - 2005

The disasters seen happening in the mainland and world hit Hawaii. The ocean rises over some land to cover it completely and land now under water rises connecting a series of islands. The changes of ocean and land are rapid and devastating.

With these natural changes come many social and personal changes. All people, wealthy or poor, must deal with survival. It is a time of forced action and choices. It is a time when temporarily, people are equal in material ownership and status, etc. but different in orientation to others and in survival skills. Some people will be self and family oriented taking and fighting to live. Other people will share and help others. Regardless of the immediate reaction, all people will realize they must relate to others and all are human with basic human needs and feelings. People previously recognized as high in status may now be unskilled in day to day survival. Other people of lower status previously may be the leaders in survival skills for large groups and families.

This few year period makes changes in everything. It is a time of basic skills, basic values, reconciliations, and humanism.

It is a period of crises and rebuilding.

Description of Hawaii in 2005 - 2025

After the natural crisis phase and rebuilding, Hawaii will be a very different place. The first phase of dualities and exploration and expansion will be over.

This third phase will emphasize several centered types of living and have blending and selections. The intense impact of the disasters and changes will be less but the effects will be evident.

Hawaii will be the center of the world in three aspects of living. Each person and family in Hawaii will select and live mainly one of these aspects. People from other places will turn to Hawaii for information and guides in three aspects -

1. Natural resources especially land uses but also ocean, solar and volcanic.

2. Technical developments especially electrical.

3. World and perspective especially for total humanistic well-being and multicultural understanding and world sharing systems.

With each of these aspects will be a type of life-style and value system.

1. Those with interest and skill in using natural resources of Hawaii will love families, traditional, small organizations, down-to-earth basics and values for living. Nature and family will be the main emphasis in life. There will be much group sharing and humanism. Material goods and modernized values will be minimized. It will be a wholesome life but very different in orientation and perspective to the other two types. Knowledge and technical skills will be from both a natural personal knowing and the use of modern science and engineering.

2. Those involved in the modern technical life will be more self oriented and changing. They will be highly skilled and knowledgeable in many fields. Their lives will be exciting and changing. However, they will also experience many strange and intense mental and physical illnesses and often be alone either by choice or as a part of the pattern of living. These people will be more interested in self pleasure and expansion and success than in families and stability. These people will have small families, will often divorce or never marry and will change jobs and living locations often. Their enjoyments will be many - material and mental possessions, a dynamic life, many activities and pleasures and association with many people but usually as short-term friendships. It is a very different life-style and value system from the other two types.

3. Those interested in and living a world oriented life-style will be a much smaller group than the other two types. This life is more self-sacrificing and less understood than the other two. These people are the humanistic and technical world oriented and world blenders. These people try to live and understand man and the world (and universe) from a whole, total and blended perspective. They are not family or self oriented but

humanity oriented. They are not nature or technical oriented but universal law oriented. They will be the people working for policies and peaceful coexistence for all people and places and life-styles. They can relate to and understand the two other types but they also see more on a larger world level. Because they work from a humanistic world level, other types often feel in conflict or negative toward them. It is a difficult life because the rewards are not immediate, rewards are complex and rewards are for humanity.

To illustrate the differences in these three life-styles (all of which will be important to the rest of the world), an example will be given.

The computer will be a dominant part of life. For the nature oriented person the computer will be used to supplement his own inner knowing and to assist at a minimum level his daily living. The computer will not rule his life ror be of prime interest.

For the technical oriented persor, the computer will be a central part of living. The computer will be used for personal, business, social and leisure purposes. The services of the computer for individual growth and status will be maximized. It will bring many jobs and frustrations and it will be a way of life.

For the world oriented person the computer will be very important. However, its use will be primarily self oriented but will be more for service and peaceful functions. These people want to maximize beneficial uses of the computer for the most groups and people in the world. These people will be active in developing policies for ethical use of computers, sharing of useful information for many groups of people, and development of services and education using computers.

Game Introduction

Part One - Develop and evaluate actual ideas for Hawaii's future in two time periods 1975 - 2000 and 2000 - 2025.

Orientation - the game and the basic steps.

Optional Round - develop two scenarios for Hawaii based on information.

Round One - characterize society topics for Hawaii.

Round Two - give examples based on characteristics developed for Hawaii.

Round three - describe types of family living for two time periods in societies developed from rounds 1 and 2.

Round four - list problems families would face in the two futures for Hawaii.

Round five - describe changes and differences for the two futures both for Hawaii and families.

Part Two - Develop an easy to play game from Part One.

Game Orientation

A. Game

1. Develop scenarios for two time periods in Hawaii's future: 1975 - 2000, 2000 - 2025.

2. Use sociological approach to develop the futures.

3. Team game involving competition in guessing sets and co-operation in evaluating and selecting the best ideas.

4. Each team works to win the most points.

5. Game can be played by rounds, given number of rounds, set time, or set number of points.

6. Game can be played by two people or teams but better numbers are 3 to 5 teams.

B. Steps of Each Round

1. Each team develops (or selects) short sets of ideas for the topic of the round.

2. Team A presents its ideas and teams B and C guess relations. Points are given to both teams guessing correctly and to team A.

3. Teams B and C evaluate creativity and possibility of ideas given by team A. Team A receives the averaged point score.

4. Repeat steps 2 and 3 for team B and then team C.

5. Look at ideas from the round and list those evaluated as best. These will be used in next round.

6. Each team total points earned for the round. Record.

Part One

Part one of the game is to develop good sets of ideas based on current knowledge and on creativity for Hawaii's futures.

Part one requires game participants to develop and list ideas.

Therefore part one is best played by those trained or interested in futures and specifically, Hawaii's futures.

From the ideas developed and selected from several part one games, a second type of game will be developed for the layman to play easily. The second game will be described in part two.

Part One: Teams A, B, C

Optional Introductory Round

GOAL: Based on available information develop good descriptions of Hawaii for two time periods: 1975 - 2000 and 2000 - 2025.

MATERIALS: Packets for each team. Packets have summaries and references of facts and ideas for the future and specifically the future of Hawaii. There are many good sources to select from for the packets.

A second source for game is the knowledge the team members have by interest and speciality.

Teams use paper for ideas, two time descriptions, and for scoring.

PROCEDURE:

1. Each team reads and discusses packet.

2. Each team develops ideas about the two periods of time and how they differ.

Part One: Teams A, B, C

Optional Introductory Round

PROCEDURE:

3. Each team writes up ideas or descriptions for the two future time periods for Hawaii, 1975 - 2000, 2000 - 2025.

4. All the teams agree on a few criteria to evaluate such as best ideas based on facts, best ideas based on creativity, best completeness, etc.

5. The teams exchange descriptions and read.

6. Teams score each other's descriptions 1-20 points per criteria per time period.

7. Team A's score for period 1975 - 2000 on facts criteria is the average points given by teams B and C. The highest score would be 20 points to team A.

8. Determine the points for each team.

9. Discuss best ideas. End of introductory round.

Part One: Team A, B, C

Optional Introductory Round

POINTS: Points per team totalled from two time period descriptions for the number of criteria used with up to 20 points average for each.

If two criteria were used, then the highest possible points for a team would be 80 points:

two time periods

two criteria

20 points times 4

Part One: Team A, B, C

ROUND ONE

GOAL: To characterize three topics uniquely for Hawaii's two time periods 1975 - 2000, 2000 - 2025.

MATERIALS: The results of the optional round would help but are not required.

The topics to consider and characterize are:

Technical

Social

Business

Individual life

Family

Policies

The teams use paper to write ideas, list characteristics, and for scoring.

PROCEDURE:

1. Each team picks three of the topics: Technical, Social, Business, Individual, Family, Community, and Policies. The three topics will be considered for Hawaii's two time period futures.

Part One: Teams A, B, C

ROUND ONE

PROCEDURE:

2. Each team for each of the three topics discusses possible characteristics for the two time periods.

3. Each team then writes three characteristics or patterns for each time period. The characteristics should be unique to be specific time period for Hawaii.

   Team_____

   Topic_____

   Characteristic_____

   _____

4. Each characteristic is written separately and without the time period for the other teams to read in random order.

5. Teams exchange topic-characteristic sheets to read.

6. Team B reads team A's sheets and guesses the time period for each characteristic. Five points go to team A and to team B if team B guesses what team A had as the time period for the characteristic.

Part One: Teams A, B, C

ROUND ONE

PROCEDURES:

7. Split the reading of team A's topics and characteristics so team B guesses half and team C guesses half.

8. As well as guessing the time period of each characteristic, teams B and C evaluate the ideas for each topic of team A. One to 10 points are given to team A per topic.

9. Team A receives the averaged score of team B and team C per topic. Evaluation is based on criteria of good ideas.

10. Optional criteria could be: fit with current facts, degree of probability, uniqueness to given time period, relevance to Hawaii.

11. Determine team points for guesses and evaluation.

12. List and discuss best characteristics for as many topics and time periods as possible.

Part One: Teams A, 3, C

ROUND ONE

POINTS: Many points can be earned by a team each round.

If teams B and C guess time period for characteristic correctly for all characteristics given by team A, then team A could earn 45 points. Teams B and C would each earn about half of 45 points or 22 points.

If teams B and C evaluated team A's ideas for the three topics with an average score per topic of 10 points, then team A could earn a total of 30 points. Team B's points would depend on the averaged scores of teams A and C.

Part One: Teams A, B, C

ROUND TWO

GOAL: To give examples to illustrate some of the latest characteristics for Hawaii's two time periods 1975 - 2000, 2000 - 2025.

MATERIALS: The best characteristics are used from round one for two time periods on these topics.

Technical

Social

Business

Individual Life

Family

Community

Policies

The teams use paper to write ideas, list examples, and scoring.

PROCEDURE:

1. Each team picks three topics with characteristics list for two time periods: Technical, Social, Business, Individual, Family, Community, Policies.

Part One: Teams , B, C

ROUND TWO

PROCEDURE:

2. Each team discusses possible examples to illustrate the topic characteristics for the two time periods.

3. Each team writes one or more examples for each topic and time period.

Team_____

Topic _____

Examples_____

_____

_____

4. Each example or set of examples for a given topic and time period is written separately and without the time period so the other teams can read in random order.

5. Teams exchange topic-example sheets to read.

6. Team B reads team A's sheets and guesses the time period for each example. Five points go to team A and to team B if team B guesses what team A had as the time period for the example.

Part One: Teams A, B, C

ROUND TWO

PROCEDURES:

7. Split the reading of team A's topics and examples so team B guesses half and team C guesses half.

8. As well as guessing the time period for each example, teams B and C evaluate the ideas for each topic of team A. One to 10 points are given to team A per topic.

9. Team A receives the averaged score of team B and team C per topic. Evaluation is based on criteria of good ideas.

10. Optional criteria could be fit to current facts, probability occur, uniqueness to time period, fit Hawaii.

11. Determine each team's points for guesses and evaluation.

12. List the best examples for as many topics and time periods as possible.

Part One: Teams A, B, C

ROUND TWO

POINTS: Many points can be earned by a team each round.

If teams B and C guess the time period for examples correctly for all topics, then team A could earn 30 points (3 topics, 2 time periods, 5 points each), Teams B and C for guessing correctly would earn half each or about 15 points.

If teams B and C evaluated team A's ideas for the three topics with an average score per topic of the maximum 10 points, then team A could earn a total of 30 points. Team B's points from evaluation would depend on the averaged scores of teams A and C for three topics.

Part One: Teams A, B, C

ROUND THREE

GOAL: To describe how types of families would live in Hawaii in the two future time periods developed from rounds one and two.

MATERIALS: The best characteristics and examples for topics and time periods are used to consider families.

Three types of families will be considered:

Average or typical

Outstanding

Deviant

The family life aspects to be considered are

Life Style Orientation

Work

Leisure

Education

Political Involvement

Religion

Daily Family Pattern

The teams use paper to write ideas, list family characteristics and score.

Part One: Teams A, B, C

ROUND THREE

PROCEDURE:

1. Each team for each time period 1975 - 2000 and 2000 - 2025 picks one type of family, typical, deviant, or outstanding; and picks three family aspects, life-style, work leisure, education, politics, religion, daily pattern.

3. Each team writes a short description (3 sentences or more) for each aspect.

Team_____

Family Type_____

Life Aspect_____

Description_____

_____

_____

4. Each description for a given life aspect and family is written separately without the time period so the other teams can read in random order.

Part One: Teams A, B, C

ROUND THREE

PROCEDURE:

5. Teams exchange the family-life aspect description sheets to read.

6. Team B reads and guesses the time period for half of team A's sheets. Five points go to team A and to team B if team B guesses what team A had as the time period for the description.

7. Team C reads the other half of team A's sheets.

8. As well as guessing the time period, teams B and C evaluate the descriptions for each life aspect presented by team A. One-10 points are given to team A per life aspect.

9. Team A receives the averaged score of teams B and C for each life aspect. Evaluation is based on the criteria of ideas and fit to family type.

10. Optional criteria for evaluation could also be added for more points.

Part One: Teams A, B, C

ROUND THREE

PROCEDURES:

11. Determine each team's points for guesses and evaluation.

12. List and discuss the best descriptions for as many family types, life aspects, and time periods as covered.

POINTS: Many points are possible per team.

If teams B and C guess the time periods correctly for team A's life aspects, then team A could earn a maximum of 30 points (3 life aspects, 2 time periods, 5 points each). Teams B and C would each earn a maximum of half or 15 points.

For evaluation team A could earn a maximum of 30 points (3 life aspects, averaged point score from teams B and C the maximum of 10 points each).

Evaluation points for team B depend on teams A and C averaged scores.

Part One: Teams A, B, C

ROUND FOUR

GOAL: To list problems unique to given types of families and time periods for Hawaii.

MATERIALS: The best descriptions of types of families and time periods for Hawaii.

MATERIALS: The best descriptions of types of families and time periods from round three.

Family types considered

Typical

Outstanding

Deviant

The teams use paper to write ideas, list problems, and for

scoring.

PROCEDURE:

1. Each team selects one family type, typical, deviant, or outstanding.

2. Each team discusses types of problems the family type may face in the two time periods. The problems need to be unique to the type of family and time period.

Part One: Teams A, B, C

ROUND FOUR

PROCEDURES:

3. Each team lists three problems for the family in each time period.

   Team_____

   Family Type_____

   Problems_____

4. The two lists for each item are written separately and without the time period so the other teams can read in random selection.

5. Teams exchange lists to read.

6. Team B reads both lists of team A and guesses the time period for each. Team C also reads the two lists of A and guesses the time periods. Five points go to all three teams if both teams B and C guess the time periods team A had used. If both teams B and C guess correctly, team A gets double.

Part One: Teams A, B, C

ROUND FOUR

PROCEDURES:

7. As well as guessing the time periods for problems, teams B and C evaluate the problems presented by team A. One-10 points are given to team A.

8. Team A receives the averaged score of team B and team C. Evaluation is based on criteria of good ideas. Team C could receive a maximum of 10 points.

9. Optional criteria could also be used and more points given.

10. Determine each team's points for guesses and evaluation.

11. List the best problems for each family type and time periods.

POINTS: Less points are possible this round as fewer lists were made.

Team A could earn a maximum of 20 points if both teams B and C guessed the time periods correctly (2 lists, 2 teams, 5 points each).

Teams B and C each guessing correctly could each earn 0 points.

For evaluation team A could earn 10 points if the teams B and C scores averaged the maximum possible.

Evaluation points for team B depends on team A and team C score average.

Part One: Teams A, B, C

ROUND FIVE

GOAL: To list changes in living in Hawaii from one future time period 1975 - 2000 to time period 2000 - 2025.

MATERIALS: Use the best results from all previous rounds 1, 2, 3, 4 on Hawaii as a society and on family living.

Consider society topics

Technical

Social

Business

Individual Life

Family

Community

Policies

Consider family aspects

Life-Style

Work

Leisure

Education

Politics

Religion

Daily Living

Teams use paper to write ideas, lists, and scoring.

ROUND FIVE

PROCEDURE:

1. Each team picks three society topics - technical, social, business, invidual life, family, community, policies, and picks three family aspects - life-style, work, leisure, education, politics, religion, daily living.

2. Teams discuss changes that may occur between time period 1975 - 2000 and time period 2000 - 2025.

3. Each team writes a brief description (three sentences or more) of changes and differences that may occur for each society topic and for each family aspect selected.

Team_____

Topic_____

Changes_____

_____

_____

Part One: Teams A, B, C

ROUND FIVE

PROCEDURES:

3.

Team_____

Family Aspect_____

Changes_____

_____

_____

4. Each description of changes for a given topic and for a given aspect are written separately for comparisons between teams.

5. Teams exchange sheets to read.

6. Only evaluations are done now not guessing of time periods by teams.

7. All teams read all descriptions.

8. Teams B and C evaluate team A's ideas for both topics and aspects. One-10 points are given in team F for each topic and aspect.

9. Team A receives the averaged score of scores from team B and team C for each type and for each aspect.

Group One: Teams A, B, C

ROUND FIVE

PROCEDURES:

Team A could earn a maximum of 60 points (3 topics, 3 aspects, 10 points maximum averaged score).

Evaluation is based on the criteria of good ideas and analysis.

10. Optional criteria could also be used and more points given.

11. Team B's evaluation points depend on the averaged score of teams A and C.

12. Determine the evaluation points for each team earned in round five.

13. List, discuss, and compare the best changes for as many topics and aspects as were covered.

POINTS: The maximum points each team could earn is 60 points. All points this round are evaluation points.

Part One: Teams A, B, C

FINAL STEP

GOAL: Records of total points earned for rounds 1, 2, 3, 4, and 5 and optional introductory round if played.

PROCEDURES:

1. Total all points earned for each team for all rounds played.

2. The team with the highest number of points wins.

3. Keep the lists of the best results from each round as possible futures for Hawaii from your teams' perspective.

Part Two

GOAL: Develop a complete, easy to play futures scenarios for Hawaii game to distribute to any layman and community groups.

MATERIALS: The lists and records used in all the games played in part one.

Forms to put selections on for use in the part two game. There would be description forms, example forms, list forms, etc. to record the best ideas on and then duplicate for use.

PROCEDURE:

1. Take all the ideas from 5-10 games played in part one.

2. Select the best ideas from each round and also varied ideas from each round.

3. Write on the forms the actual ideas relevant to each round. Make a large selection.

Part Two

PROCEDURES:

4. Write easy to follow directions, examples, and actual written out choices on cards for each round.

5. Develop an easy to play selection - guess - and evaluate idea game for laymen to play. All forms included. Blank forms are also included if people want to develop their own ideas as participants did in part one.

6. Include in game reports of actual aspects of selections made by the experts playing part one in 1978-79.

7. Produce complete game of five rounds for distribution to laymen interested in futures and Hawaii.

WRESTLING WITH GIANTS: State of Hawaii vs. Satellite Business Systems

Hal Glatzer

"Hawaii has got to become a part of the U.S. It must be integrated into the communications networks." Those are encouraging words, from a former chairman of the Federal Communications Commission. He and the State of Hawaii's Department of Regulatory Agencies (DRA) are allies in a struggle to bring Hawaii into full partnership with the mainland. The battleground is the F.C.C. itself; the antagonist is a multi-corporate entity and the objective is a future--an era of digital satellite communication.

By the end of the 1990s, telecommunications in the U.S. will most likely be digital in nature: information will be coded in "on" and "off" pulses. Presently, it is the analog method of modulating a carrier frequency or amplitude which characterizes telephone and television transmission as well as radio. Conversion from analog to digital has already begun (the television pictures from Mars were digital) and will be accelerated by the perfection and implementation of light-wave systems (optical fiber and laser amplifiers) and the continuing proliferation of computers and computer-based hardware in non-computational applications.

Inefficient compared with digital transmission, analog is nonetheless important today because the peripheral devices at each end--the telephone handsets, video tape recorders and television receivers--themselves operate in analog fashion. But most computers are digital instruments, and it is an accepted premise in the data processing industries that soon computer-to-computer and terminal-to-terminal interaction will assume a larger and larger share of telecommunications traffic. The need for circuits capable of handling digital communications directly has already been established. Airline and hotel reservation systems, payroll and inventory transfers and electronic banking are digital networks whose information is converted to analog for transmission over conventional telephone circuits. Large users of data processing services, particularly corporations with many branches or subsidiaries geographically dispersed, today share their data--if, indeed, they do so at all--by leasing private circuits from their local telephone companies or from "long-line" carriers like AT&T. Slow and noisy, these leased lines are ripe for digital competition. The long-line carriers have too much money invested in the present network to compete with themselves until the hardware has paid for itself, but it is the intention of the Satellite Business Systems (SBS) to lure that computer-to-computer traffic away from the coaxial cables and send it over private circuits by satellite. Its time frame is the next ten years and beyond.

Restrained by the U.S. Justice Department from entering the telecommunications field directly, International Business Machines (IBM) formed a partnership with Aetna Casualty & Surety Co. and COMSAT General Information Satellite Corporation, the former providing capital and the latter its technical skills. SBS, in its own words, "will offer...digital transmission of voice, data and image traffic among geographically dispersed locations, much as a private branch exchange (PBX) provides switched (telephone) communications within a single facility." A corporation could, therefore, mount a small antenna on each of its various buildings' roofs and send computer data, television or still pictures, facsimile documents and ordinary voices directly to or among its scattered branches. Memos, minutes, graphs, charts, tape recordings--all of the intra-company traffic would be converted to super-efficient digital signals through a computer and relayed by satellite more than 600 times faster than is now possible over analog telephone lines.

Though aiming at the computer data traffic, SBS admits that its customers will want to take advantage of facsimile transmission at "two to twenty times" the present speed. "The economies of scale and ease of use may well push facsimile to the forefront of hard copy transmission systems;" that would be a dynamic advance over postal mail speeds as well and would stimulate 'electronic' mail services. SBS also encourages "teleconferencing...between two or more locations, thus offering most of the communications ability available today only through travel."

(Since most of these kinds of traffic, including all voice telephone communications, is presently sent over common carriers' circuits, there is opposition to SBS from AT&T. But the Justice Department has also prohibited AT&T from entering the data transmission market until 1979 deliberately in order to encourage competition.)

Other applications for SBS include library and data retrieval from corporate headquarters by subsidiaries, interactive graphic and design terminals which permit simultaneous creation by remote engineers, video duplication without mailing bulky tapes, and there are probably many uses which will not become apparent until the system is operational, in the early 1980s.

As attractive as SBS appears, there is a serious problem for prospective users in Hawaii: it may not come here. SBS says flatly that there is "no foreseeable demand for SBS service in Hawaii." After crosschecking the 1975-76 Hawaii Business Directory with its own list of "415 enterprises" it considered likely to subscribe, SBS says it surveyed 30 local businesses or branches of mainland corporations.

(None were named in its memoranda to the F.C.C.) SBS says further that it hired a consultant to verify the governmental and private line circuit usage here, and that the results were the same: "the amount of voice and data requirements...both now and in the foreseeable future, would not support a requirement (by the F.C.C.) for SBS service in Hawaii."

Over a year ago, the State formally petitioned the F.C.C. to either require SBS to serve the Islands or deny its license to operate. "SBS hasn't told the F.C.C. who--if anyone--they've signed up, so we don't think we have to come up with a list of potential users ourselves," says John McConnell, Deputy Director of the DRA. "Historically, you had to show a demand for services before they were offered, but recently the F.C.C. has been encouraging competition for its own sake--with which we agree in principle." Introduction of a new telecommunications service often creates its own demand, according to the former F.C.C. chairman: "It's chicken-and-egg," he says. "In 1956 you had the first telephone cable to Hawaii. They thought it would take four years to fill up, but before the year was out the traffic had mushroomed and they had to start work on a larger cable."

McConnell points out that SBS's market survey apparently failed to include Hawaii's military communications needs. Besides their own satellites, the armed services typically lease private circuits from common carriers to transmit non-classified information and to provide "redundancy" in case of failures. McConnell points to construction in Wahiawa, Barbers Point and Kokee, Kauai, by RCA Americom and Western Union International of giant satellite antennas for military traffic: "Face it, the military is the biggest user there is." And it is likely to remain so through the rest of this century at least.

SBS is reluctant to serve Hawaii, too, because of the cost. It insists that the addition of a "spot beam" antenna, aimed directly at Hawaii, would add weight and cost, and consume power, thereby shortening the life of the satellite aloft. (SBS has promised, however, that the next generation of its satellites would serve Hawaii--some seven to ten years after the first is launched.)

"It's an economic, not a technical problem," admits Joe Harcarufka of the F.C.C., and electronics engineer and satellite designer working in the Common Carrier Bureau. "SBS is putting up their own money. How far should the government get itself into a company's business judgement?"

An unwritten law of nature is Tradeoff-and-Sacrifice; no more obvious anywhere than in electromagnetic communication. To achieve its high rate of transmission, SBS must sacrifice range. As with two-way radios, more channels can be allocated on higher frequencies, but their broadcast distance is reduced proportionally. Analog telephone and television satellites can "see" from the Atlantic Ocean

to Hawaii and relay signals from anywhere within that "footprint". But to pack in the vastly greater volume of information which digital systems require, SBS was designed to use a higher frequency. At its anticipated peak, the signal will be switched on and off some 6.3 million times a second, and transmitted on a frequency that vibrates 10 to 12 billion times every second (one says "6.3 Megabits at 10/12 Gigahertz"). The higher frequency requires a much narrower beam, and consequently a smaller "footprint"--about the size of the 48 contiguous states.

According to the F.C.C.'s Harcarufka, the alternative to the spot beam is to increase the size of the earth station, the "dish" that a customer would install on his premises. SBS was designed for use with a very small, inexpensive dish about five meters in diameter, costing only a few thousand dollars each, once they are mass-produced. (That compares with the tens or hundreds of thousands needed for a large dish such as the ones which bring us telephone or television signals now). If SBS were forced to enlarge their required antenna by 20 to 50 percent, Harcarufka estimates, the cost would go up exponentially. For construction or safety reasons some company installations, particularly on urban rooftops, would no longer be possible.

"Frankly," says Harcarufks, "Hawaii may find it cheaper to use their common carriers (e.g. HAWTEL) and interconnect to an SBS site on the mainland." SBS too recommends interconnection.

That makes the State of Hawaii very angry indeed. "SBS has not delineated the manner in which interconnection will be implemented between Hawaii and the mainland," says the State's position paper, "under what conditions and at what cost...(nor) the matters of...transmission routing or interconnected signal quality." (emphasis in original).

An independent, New York-based communications consultant points out what he calls some "myths" about SBS. "Nobody's waiting for it," he says. "Businessmen are only interested in the service itself, they don't care how you transmit it. By the time it's really up--say 1980 or 81--it'll be launched in the Space Shuttle, the extra weight of a spot beam won't make that much difference. By then the cost of earth stations will be much, much cheaper than it is right now. And SBS says they're only after the computer data traffic. Well, the bulk of any company's transmissions will still be voice." He thus raises 'scenario' questions which affect the future of the service and its relationship to other common carriers with whom it will compete. For Hawaii's private sector, he has this advice: "Rent a consultant. Find out exactly how much business you will actually generate. If your potential users got together you could probably justify the cost of sharing one earth stations among you. But, he notes, "your private sector may not perceive the urgency of doing so. Anyway, it's still a business decision. If you can't get SBS to give you a spot beam, negotiate with them for interconnection."

The State is prepared, McConnell admits, to do just that, if its appeal to the F.C.C. fails. But the argument the State has raised is fundamental to the future of the Islands: "It's about time Hawaii became part of the U.S. We've got to be treated the same as a mainland state. Until we are, business can not extend services into Hawaii at a reasonable cost, and our communications users here will be at a disadvantage," says McConnell.

Hawaii has had such limited communications services in the past that any improvement or increase seems welcome. But planning for the future requires that we have all the available options open to us, now and throughout the rest of the twentieth century.

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BRIDGING THE SOUNDLESS GAP

John Southworth

Background

Various techniques to utilize electronic communication technology are proving successful and popular in pilot projects around the country. The Kendall Demonstration Elementary School for the Deaf at Gallaudet College in Washington, D.C. has been a leader in using computer-assisted instruction. Items 1 and 2 describe the encouraging results of preliminary research in this area.

The teletype has become a popular new tool in both deaf-deaf and deaf-hearing communication. The use of teletypes linked via acoustic coupler and ordinary telephone allows two parties to exchange typed information.

The Catholic Deaf Center in New Orleans has been using a system of recorded teletype lessons (Item 3). The system is functional 24 hours a day, seven days a week. This has provided a new dimension to education of the deaf. Its success would appear to more than justify exploration of its potential value in other localities.

Computer-based and satellite communication is growing (Item 4) and will, undoubtedly, be an important aid for the total spectrum of communications needs. An important factor in such utilization will be regulation and rate structure control.

Hawaii Setting and Plans

In Hawaii the deaf have developed an enthusiastic corps of "TTY" (teletype) users who communicate with one another via teletypes. The Educational Computer Unit at UH/Manoa has demonstrated the potential of computer communication and information retrieval at the May 1977 Deaf Awareness Week at Ala Moana Center. A computer terminal linked to the HP 2000 Computer at the University of Hawaii allowed persons to get a hands-on experience of exchanging messages, reading news, and trying a range of computerized programs from games to advanced mathematical calculations.

This past summer Edu-Comp has been working to develop audio-visual and computer modules to aid hearing persons learning American Sign Language skills via videotape, slide-tape, and computer drill and practice programs. Edu-Comp's Deaf Awareness/Communications Experimental Program is summarized in Item 5.

The presence of 8 terminals on the University of Illinois Computer Based Education (CBE) system of PLATO has opened up a national scope to the project. Besides the availability of thousands of hours of CBE lessons, the communications potential of PLATO's systems news, group notes, personal "mail", and "talk" modes have added an exciting new frame to the project. Edu-Comp has started a group notes file called DEAFAWARE, which is a public forum for persons throughout the country interested in programs related to the hearing impaired. DEAFAWARE has already provided knowledge of two sign language finger spelling lessons on PLATO. Periodic computer conferences on PLATO's TALKOMATIC program are planned to allow up to 5 persons to "talk" together on items of mutual interest in this field.

Based on the success of the initial experiences, plans are under way to extend the present slide-tape computer program. At present the system utilizes a slide projector besides an IBM/APL computer terminal. The user is the interface to advance/choose various slides. The new mode plans to utilize PLATO's integrated microfiche slide/audio disk/touch panel capabilities. This will not only facilitate more flexible use but also aid in gathering data for research purposes in testing the new learning resource.

Interest has been expressed at such leading institutes for the deaf as Gallaudet College, National Technical Institute for the Deaf, and Arizona School for the Deaf and Blind to join PLATO. In San Francisco a group is working on special programming of PLATO to aid in education of the hearing-impaired. These efforts, if communications links can be maintained, will allow for accelerated development and sharing of resources not only among the deaf but for teaching hearing programs communications skills.

Future development would appear most likely to occur in the biophysics and bioelectronic fields. As the human nervous system is better understood in relation to basic electrical impulses and human physiology interfacing, the potential for artificial ears seems a logical direction to finally end the soundless gap before 2020.

Recent policy decisions to support civil rights of handicapped persons would seem to indicate a movement to more seriously attempt to end many of the de facto forms of discrimination handicapped persons face. An unrelated but important associated policy decision is that in the area of communications. Will government and industry

regulate communication technology and costs to allow for meaningful utilization of state-of-art resources by the common and uncommon (e.g. handicapped) person? These factors, as much as state-of-art technology, may well be the keys if the rate the gap is successfully bridged.

Scenario Presentation

If selected for presentation, an attempt would be made to demonstrate several modes described in the preceding scenario outline.

1. Teletype-Teletype Demonstration.

Use of teletype of typed communication by two members of the deaf community.

2. Videotape demonstration

Example of use of videotape in sign language class drill and practice and testing modes.

3. Slide/tape demonstration.

Basic unit of teaching sign language alphabet with audio tape and slides. (Audio description can precede or follow slide, depending on learning/testing mode desired.)

4. Slide/computer demonstration.

Advanced form of 3 using, instead of tape, APL computer program developed to test for sign recognition.

5. PLATO demonstration.

Present DEAFWARE group notes, TALKOMATIC conferencing, sign practice quizzes, as well as demonstration of random access audio disk and music box capabilities would be possible.

HAWAII'S SOCIO-CULTURAL COMMUNICATION CENTERS: A System for Citizen Access to Health Related Information and Communications

Lida G. Chase, Larry Lister, Maggie Matthews

Preface

That certain persons in Hawaii have interest in and commitment to the systematic development of appropriate communication technologies is indeed laudable. That some of those same people seek to engage a variety of individuals as resource persons for the dialogue on communication issues and as resource persons for developing notions about our future is encouraging.

The authors of this scenario have been intrigued with this opportunity to spin some fantasies about health relevant communications futures. But simultaneously they are plagued with a scope of current responsibilities which makes more adequate participation in this endeavor impossible. Thus, this modest scenario addresses only one of many possibilities, and is submitted as a reflection of keen interest in the policy and planning actions, but with acknowledgment of constraints within which the authors must work. It represents the outcome of some initial brainstorming sessions, as well as an enthusiastic hope that there will be high potential for considerable health related developments in association with Hawaii's Communication Futures.

Background

There are many givens to the direction this scenario suggests, not the least of which is the cultural diversity found within Hawaii and the related complexity of human needs arising from this heterogenous milieu. It seems that any social policy and action must allow for this environment. Therefore, the suggested communication system is designed to allow for diverse participants.

Further, the geographic dimensions of Hawaii - as apart even from those of other states - suggests potential for isolation from the newest developments on the mainland and in other parts of the world. Thus, the suggested communication system is designed with the relationship to the world outside Hawaii held as an important consideration.

Two other ideas seem pertinent: the future communication systems in Hawaii allow for two way processes and that the systems, at least in part, enhance citizen's abilities to fulfill the basic needs of their day-to-day, mid-Pacific existence.

Health policy issue debates today revolve about the problem that health care is not yielding better health status for the population. Costs of care are skyrocketing so that it seems advisable to keep people out of the medical/illness care system. Alternatives rest with disease prevention, health promotion and maintenance.

Proposal

Geographic locus of centers: The proposed communication centers would be placed in strategic large supermarkets on each of the islands. The supermarket locus allows for extension of existing socio-cultural patterns: already they are visited by citizens of all ages and all cultural groups; already they are institutions which are an integral or familiar part of most citizen's lives; already they are the scene of informal social communication interchanges, and already they are the source of material goods and some services which fulfill basic needs. Further, this locus is psychologically consonant since food/nutrition in general equates with health.

The target population: The group with which this proposal is most concerned is that of the nameless consumer - the average citizen of Hawaii of varied age, varied culture, varied socio-economic standing. More particularly, though, the consumer with special problems in obtaining goods and services is of interest: these are the individuals who perhaps need some extra help in managing certain aspects of their lives. These might be people who initiate some attempt for services for themselves or those consumers who are guided toward services by others.

The content suggested for the communication system: The content for the communication system, the focal point of messages or information is health.

As the geographic locus of the socio-cultural communication center is to be the expanded supermarket, it is proposed that for initial demonstration purposes the information exchange system deal particularly with nutritional and pharmacological needs in the health spectrum.

Thus it is suggested that individuals be able to obtain from the communication system information on suggested weekly diet, given, for example, such particular individual parameters as culture, money available for food that week, family size, medical problems, and food preferences. The weekly menu offered by the system could include recipes. The system would, in addition, store for retrieval information on previous purchases and immediately calculate the rate of consumption before advising new weekly purchases.

It is further thought that such a communication system might facilitate the ability of the citizen to obtain appropriate medications at the

supermarket as prescribed by the individual's physician. It is seen that barriers to handling refills of prescriptions might be eliminated by an effective communication system thus eliminating or minimizing inconvenience for such persons as the ill and elderly.

Coupled with the above described services would be potential for delivery of information or communication exchange broadly supportive of people's efforts to be more sophisticated consumers of health care services as well as being potentially better able to maximize individual responsibility for their own health related behaviors. The proposed system might provide information exchange on such wide spread concerns as weight control, control of smoking, enhancing family communications, management of school related problems of children in the family unit or recommended programs for physical activity.

The communication system hardware: The basic ingredients for the system lie within the realm of technological capabilities currently existant: telephone networks, computer networks, and audio-visual devices such as videotape playback units, 8 MM continuous loop machines or slide-tape machines. The latter three devices are obviously suggestive of the need for some packages softwares too.

However technologically available the hardware systems are today, the envisioned communication network requires new patterns for communication system linkages, shifts in funding priorities; and new views of existing socio-cultural institutions.

The core of the expanded supermarket notion is that a segment of supermarket space be designated as the health communication center. In this center, with access to the target consumer group, would be computer terminals which have capabilities for visual display (as with the PLATO System) and for printout. The terminals would allow for two-way communication between consumer and health professional via the intermediary of a data bank. Also available to the consumer would be varied auto-tutorial mechanical devices which would allow for self-instruction on selected health related topics. In addition the center would house a telephone dial - access system for providing those unable to personally come to the expanded supermarket with information - albeit one-way delivery and more restricted information in breadth, depth, or degree of personalization.

It is thought that the computer system might provide the citizen with ability to obtain up-to-date, personalized information about health related needs through such capabilities as individualized record keeping (on say pharmaceuticals used) and development of feedback based on individual parameters. Thus, for example, the consumer might provide the baseline data as income, family size, food preferences, cultural affiliation, and medical problems which could be processed for the computer to return suggestions about what menu to plan and what food commodities to purchase.

It is envisioned that a consumer resource person would be available at the expanded supermarket health communication center at specified times to assist the consumer in use of the center and its facilities.

The human organization support system: Varied levels of institutions and organization might be utilized for operation of the proposed communication system. As the geographic loci of the centers are proposed as existing supermarkets it would be anticipated that the world of private enterprise would be organizationally implicated. This scheme is viewed as potentially beneficial for the business world as well as the consumer.

At another level it is seen that an organized body of persons in health related professions be involved - together with appropriate administrators and consumers - to obtain the up-to-date information from Mainland and international sources that is supportive of sophisticated health care services. This suggests quite another level of communication system - as for continuing education of health professionals.

In addition to having primary responsibility for acquiring new and up-to-date information this group of individuals would in turn be responsible for organizing what information would best be transmitted to consumers. This basically professional group might be organized under the aegis of existing State agencies/institutions as the Department of Health or the University of Hawaii.

Quite obviously some agency or institution would need be assigned primary responsibility for management of the hardware systems per se, as well as of any associated software packages.

Funding of the communication system: It is suggested that some funding of the system might come from private enterprise with which the system is tied; this funding would be akin for the business to money spent on advertising in the popular media or on promotional drives of one sort or another. Another source of funding would be seen as derived in part directly from the consumer: that is, the consumer would pay for communication services of this nature just as does he pay to purchase a television set or stereo, purchase a newspaper or magazine, or buy the milk, eggs, and medicine. Without doubt other sources of funding would need be developed.

Issues: Certainly there are a variety of issues which would be associated with planning and implementing the expanded Supermarket Communication Center:

- which among multiple private enterprises would opt for, or be selected for, participation in this endeavor?

- which agencies/institutions - private or governmental - would have primary responsibility for an extensive communication network?

- which health professionals are prepared for contributing to an idealized health information communication system say for acquiring and designating knowledge to be disseminated to consumers?

- what information about consumers can legitimately be placed in the data bank of the computer system and who other than consumer would legitimately have access to that personal information?

Confrontation of such issues seems beyond the scope of this limited proposal, but it is thought that given more time and energy the authors might be more specific in addressing the inevitable critical questions.

Extension of the proposed system: It is thought that the proposed communication system has potential for expansion such as by giving citizen access to other kinds of personalized consumer information or by giving access to regionalized (for example Nuuanu) news for residents of that specific area. Also, as we mentioned earlier, the system is suggestive of other levels of communication systems as for continuing education for professionals. It is not within the scope of this modest proposal, however, to expand the generalized ideas further afield.

Summary

The authors have proposed extended supermarkets as the basis for socio-cultural - communication centers developed to meet some of the basic health needs of Hawaii's unique citizenry. The core hardware systems located in these extended supermarkets would include computer terminals with visual and print-out capacities, auto-tutorial machines coupled with appropriate software packages, and telephone dial-access system. The proposed initial information flow for which the communication system would be used is to be related to health, say at least at first to nutritional and pharmacologic aspects and needs.

It is hoped that this initial effort at generating ideas for communication systems as related to health needs and health care will serve as catalyst to further discussion and planning - both among professionals in the health and communications fields, and later with participation from consumer groups.

ELECTRONIC MULTICULTURAL EXCHANGE ENHANCEMENT

John Southworth

AFS Background

The AFSIS was an outgrowth of a volunteer ambulance corps in World War I. Exchange of college-level students between France and the USA was its original mode to help promote better international understanding.

After World War II, AFS shifted its emphasis to the high school level so that greater family and community immersion experiences could take place. Today the program annually involves thousands of teenagers from all over the world. The various youth program modes of AFS include:

WP - Winter Program. (Students from overseas visit USA, live with local families and attend local high schools as seniors.)

AA - Americans Abroad. (American teenagers go overseas for up to a one-year period)

DP - Domestic Program. (Exchange of youth from several months to one year long between different cultural and geographical areas of the USA)

STE - Short Term Exchange. (Usually a one to three week exchange of youth between AFS communities within a country or geographic region)

MNP - MultiNational Program. (Exchange of youth between other countries and not involving the USA)

Each country participating in AFS has a national office or volunteer organization. The international headquarters is located in New York City. Dr. Stephen Rhinesmith, himself an Americans Abroad returnee (Germany), is the current president of AFSIS. Each school/community participating must have a volunteer chapter of parents, students, and teachers who handle the details of home and student interviews, fund raising, special projects, etc. District representatives help coordinate details between local chapters and AFS in New York.

AFS in Hawaii began in 1970. From a single chapter and one statewide district representative, the program has grown to include chapters on Oahu, Maui, and Hawaii with separate district representatives to serve each island. Students have come from and gone to every continent on the earth.

AFS/Hawaii has been a quasi-international program from the start as it is the gateway between the mainland and Asia. Hawaii has served as stopover point for the Micronesian students coming to and returning from the mainland.

Technology has become an important part of the AFS/Hawaii program. For several years, AFS/Hawaii has been able to computerize such things as its roster, periodical newsletter, address labels, and standard/multiple-copy correspondence.

Even more futuristic has been the ability of AFS/Hawaii to utilize NASA's ATS-1 PEACESAT communications satellite. PEACESAT has significantly opened new vistas to AFS as experienced in Hawaii. Since 1972, the AFS/UH group (Item 1) has coordinated periodic programs called PAFSPECS (for Pacific/AFS PEACESAT Educational Communication System). Starting orginally with a communication link with the New Zealand AFS National Representative in Wellington, PAFSPECS has also variously involved participants over the years in Saipan (Micronesia), Raratonga (Cook Islands), Lae (New Guinea), Fairbanks and Juneau (Alaska), Santa Cruz (California), Honolulu, Hilo, and Maui.

The standard format for a PAFSPECS program involves setting a mutually convenient time for all participants around the network. One group is selected as coordinator and the agenda is set. During the actual program, besides regular news exchange, a variety of special features may be held. They have included:

* Taping of greetings to/from participants at conferences held elsewhere.
* Coordination of the first STE between Juneau and Fairbanks, Alaska.
* Finalizing between Honolulu and Saipan, student schedules for Micronesian AFS'ers in Hawaii enroute to the mainland or home.
* Organization and follow-up counseling with AFS/Hilo, the first AFS/Hawaii chapter off the island of Oahu.
* Discussion of proposals resulting from the last AFS World Congress.
* Foreign student counseling workshop discussion between New Zealand and Hawaii.
* Periodic slide "shows" on countries of AFS participants.

The last-mentioned is the newest PAFSPECS activity mode. While the coordinating student describes each slide, the commentary is simultaneously broadcast to each station, where participants view duplicate slide sets shown in each locality. The commentary, question/answer and discussion are recorded for use at subsequent AFS, school or community programs.

Plans are underway to exchange videotapes for a more dynamic, visual documentary exchange between AFS/Hawaii schools and overseas counterparts.

Another idea is to experiment with a PEACESAT-PLATO communications link. PLATO is the University of Illinois-developed computer-based education system with over 1000 terminals scattered around the country and abroad. A "talk" mode allows two or several persons at terminals around the system to converse. As Hawaii will have PLATO for a pilot trial period, we may be able to expand our Pacific PEACESAT network with AFS counterparts at PLATO terminals on the mainland.

Some of the these projects were featured, including a live PAFSPECS program, at the 1976 World Educators Conference in Honolulu. Item 2 is an abstract of the "Computer and Communications Satellite Technology as Skills Training and Programming" presentation that AFS/UH gave. Item 3 is a copy of the text-editing by computer Ho'olauna AFS newsletter. Its cover story outlines the recent AFS Futures Festival which focused on the potential electronics technology has to aid multicultural communication.

With the continuing escalation in energy and travel costs, it seems only logical to explore use of communications technology to both save money and energy as well as to provide an expanded communications network for both cultural and administrative purposes. With thousands of volunteers around the world, AFS is a prime candidate for a pilot project to test new modes of both student as well as electronic exchange.

One way to economize on costs and energy would be to expand a student "exchange" to a 2 to 3 year experience. An initial "pre-year" of school and community satellite/computer discussions and video exchange would provide for a "get acquainted" period prior to the actual exchange of (a) student(s) the second year. The third year might be a "post-year" experience to focus on re-adjustment and continued exchange activities (letters, slides, videotapes, etc.) once the students are back home.

An actual example of this sort of post-experience was exemplified when Puanani Anderson (AFS/Kamehameha, Hawaii Americans Abroad to New Zealand 75/6) shared her slides on a PAFSPECS program during the AFS/UH Futures Festival last February. The discussion was further enhanced by the presence of AFS/New Zealand student Leigh Ingle, AFS/ Wahiawa Winter Program student last year. The interplay of discussion of interesting similarities and differences between Hawaii and New Zealand was fascinating.

It appears both satellite and computer communications networks are expanding. As energy costs make actual travel more expensive, we should begin to study alternatives such as those mentioned above

to continue to seek better understand and closer communication. It is important to note, unless we reach a world transportation crisis, that electronic exchange should be viewed as supplemental or complementary to the people-to-people exchange. However, increasing evidence points to the need to find ways to better exchange ideas and information than people themselves. AFS/Hawaii has capitalized on its isolated geography to begin the exploration process.

Future Directions

1. Increased use of computers for routine management tasks.
2. Expanded satellite communication potential requiring reorganization of priorities and development of new techniques for intercultural exchange and discussion.
3. Greater use of non-print media (slides, videotape/disks, etc.) to exchange information and document cross-cultural experiences.

Scenario Presentations

1. Videotape documenting computer and PEACESAT activity of AFS/UH.
2. Computer demonstration of management/information retrieval techniques.
3. (possible) Live PEACESAT exchange; at least slide/tape summary of PAFSPECS program.
4. (possible) Live PLATO demonstration and conferencing with individuals about cross-cultural communication via the system itself.

HAWAIIVILLE 2020: A COMMUNICATION SCENARIO

Nola Morgan, Peter Scott Wong, Scott Sharpe
Phyllis Kihara, Tom Witthans, Lorenzo P. Rivera
Lori Morita, Irwin Queja, Brian Doi
Lisa Sumida, Edwin Hata, Charles Dean Ingram
Evelyn Horiuchi, Timothy Bryan, Wayne Yasutomi
Alice Lee-Barela

Sunrise:

Kimo wakes up with the sun. He likes sunrises. He checks his personal biocomputer and sees that he is in good health. This seems like a good time to have a little playtime with his girlfriend Lani. . . .After playtime, he checks in with his computer for his day's agenda. He sees that today is the day he is scheduled to move. Now that he is 20, he is moving out of his parents' home. When he was 15, a complete module home was made for him and attached to his parents' home in anticipation of this day, as is common practice, and now that day has arrived. He has chosen a location that will provide an undersea view of the sunrise. His module, which is composed of "Ice 10" will be transported whole with all belongings inside by the Electro-Aquatic Moving Company of Hawaiiville. He transfers some personal funds to the Hawaiiville Housing Authority and makes the arrangements with the movers.

He checks with his work agenda to see what the day will be like. Then he checks the Future File - the refrigerator unit in his home will malfunction in three hours, two minutes and five seconds. He programs auto-fix and hopes it will solve the problem. He then consults his future calendar - nothing new.

The usual work day for Kimo is three hours, but today, because he is moving, he plans to work for only one hour and makes arrangements for his counterpart in Malaysia to handle the extra load.

Kimo is a member of a team in charge of satellite communications for the South Pacific. He checks his work program for problems and self-study schedule. Problem: one of the satellites of Australia has drifted out of orbit, possibly because of cosmic gravitation interference. Problem: Communication overlap in Peacesat 27. Looks like both problems stem from the same cause. Kimo punches in the satellite re-orientation station on the moon. They will have to handle it. Automation won't work here. SRS will send a crew from station-70 to repair the satellite and put it back on course.

Midday:

Kimo decides to go out for a bit of recreation ard exercise while his home is being moved. He steps out the front door into

the vacuum tube which transports him immediately to the ocean. He steps in the ocean and swims out to find his best friend Elua, the dolphin. Elua has just returned from a Communication Conference. He teaches Kimo another lesson in bio-sonar capabilities. They also spend some time watching the whales migrate. Kimo uses his portable underwater breather lung while underwater, so that he need not constantly surface. Elua has just paid a visit to Niihau to observe the happenings there and he tells Kimo about this visit. Niihau is a primitive community which refuses to join the world of 2020 and continues to live as they did in the early 1900's.

After a while, Kimo and Elua decide to eat. Their meal consists of sauteed blue-green algae, soy bean-plankton protein concentrate, and kelp beer. As Kimo is finishing the meal, he receives a message from his girl friend Lani. She had remained in the module during the move, as she was plugged into the sleep-teacher learning bionetic fusion. She wants to know where he now is, and what is the new location of the module. She also requests permission to borrow his work computer to confer with others in the bionetic fusion field. He tells her the location of the module and that it is ok to use the computer. Since he was finished with his exercise period, he tells her he is on his way home. He swims to the new location and enters through the air lock.

Late Afternoon:

Some time later, Kimo and Lani decide to go to Spain for dinner. They use teleportation as it is much faster than the usual space shuttle. After dinner they return home to greet their friends and family who are arriving for the location-warming party.

Evening:

Guests at the party are of all ages - from 2 to 115 - and of several species. In attendance as guests are 19 earth humans, 5 dolphins, 6 out-of-earth humans (from space stations and the moon). There are also 4 robot servants present. Some of the guests in attendance include:

Wyman and Arma, Kimo's parents. Kimo's father Wyman is about age 50. He is a former professor of ancient history (early 20th century) at the University of Hawaii. When the U. of Hawaii closed in 1995, being phased out as an archaic institution, Wyman was 25. He has never been able to adjust to the rapid changes in his life. He has spent most of his time since then as a beach bum. While the rest of the community is fashionably nude, or wears light-weight disposable clothing, Wyman still wears cloth aloha shirts, shorts, and slippers. As is typical in 2020, eccentrics such as Wyman are considered valuable contributors to society, and he is a popular conversation partner. Arma, Kimo's mother, is 52. She is an agricultural algae-geneticist. Since Arma gets vacuum-sick, she and Wyman came to the party by teleportation, even though it was only a short distance, rather than through the usual vacuum tube.

There are also guests of about the age of Kimo and Lani. Ulgo, a satellite repair person from a space station and his female companion are in attendance with Rago, their 4-year old natural child. Ilma is an educational facilitator. Her interaction group is of mixed age, their area of study being non-human communication.

Kara, another colleague of Kimo's, is also there with her 2-year old female cloned child. Kara is in Intra-Community Psychic Communication.

Another attendee is Mukkl, a bionic researcher. He proudly displays his 6-armed bionic extension - it straps on his back and is connected to the brain by electrodes. Because of his 8 arms he is also performing as a one-man band for the party.

Hilgi, an 85 year old pioneer in human-dolphin intercommunication, is also there. With Almbu, the dolphin, the first such break-through was made in 1991.

Almbu, the dolphin, is also there. He is now a consultant as is Hilgi. Almbu is much distressed that only 5 dolphins are in attendance at the party. He keeps referring to himself and the others as "token" dolphins and complains that he is tired of being a "second-class" citizen.

Elua, Kimo's best friend, the bio-sonar technologist, is at the party along with his female companion Urgga, the dolphin, who is chief of Underwater Security, and their natural 5-year old female child Tiggi. Tiggi works part time as an algae gatherer.

Another dolphin, Torma, a beautiful aquatic ballet instructor, is also there. Almbu seems to forget his complaints when Torma is around.

(Note: all five dolphins are suited in moisture tubes, since the atmosphere surrounding the party guests is air.)

Party Games:

As Kimo is modern in his thinking, he has provided for guests a group of games which they play if they so desire. Some of these games are:

Time Machine - using the time machine, competitive games may be played at different points in time by participants, with rules determined by group consensus and relating to the time and circumstances of the game. The general goal of the game is to be declared winner, that is, the perpetrator of the most bizarre act.

Cosmic "Pass-Out" - this rather rowdy game is played drinking recycled, fermented sterilized urinebeer (world class). The winner is whomever drinks the least amount before passing out.

Three-dimensional Holographic Chess - group or dyad chess. It may be played with a computer or interpersonally.

Pin the Code on the Alien - One or more participants are "it", playing the alien(s). They use computers plus their heads to invent an alien language, or use a real one, if available. The others must try to decode it. First successful decoding wins, and winner becomes Alien.

Simulated Communication Futures - participants postulate futures for the year 2070, 2080, 2090, 3000, 3020. Winner is determined by whomevever is closest to the computer's prediction.

Psychic Marathon - contest in psychic abilities (telepathy, telepathic reception, psychokinesis, clairvoyance). Scoring is done by the time machine. Can also be played in individual field meets where only one event is featured.

Four-dimensional Checkers - rules involve variable time limits - one sequence may allow 30 seconds, but the move must be made between the 24th and 26th seconds, for instance.

Sex with a Robot - you have to climax at a certain time. It requires precise timing to make his/her eyes light up. For amateurs, a clock is provided - winner will go to the finals in Paris.

Death Experience - participants may have a 5-minute sample death experience.

Pleasure Pad - guests may elect to go to the Pleasure Pad Room. Galactic waves are introduced into the room and everyone goes on a pleasure trip. These waves are pre-programmed by the host to accommodate specific pleasure patterns for his guests. The galactic waves have the capability of inducing any combination or distortion of the human sensory system. Any feeling or sensation can be reproduced and induced to the group. Recreational drugs are a thing of the past with the development of the pleasure pad, since it is not harmful to either the body or the brain.

After the trip, everyone begins to discuss Kimo's new machine. Kimo is one of the few people who own such a machine. One guest expresses a fear that such a machine will have detrimental effects socially and politically. He is reassured that there are enough safe guards, and that it is harmless.

At the end of the discussion, it is concluded that the machine is a good replacement for recreational drugs, but its behavior modification capabilities must be studied more carefully because it defies the first law of robotics - it can harm a person if he gets the wrong program or, someone could use the machine to destroy another person.

Conversation:

In addition to the games and recreation, the ancient and time-honored tradition of conversation and interpersonal communication is also obvious. Several topics are discussed:

Thanology - Planning to Die - Some of the possibilities discussed are:

1. Reincarnation - Upon dying, all brain information is transformed into a computer, and one can reincarnate by reproducing him/herself into the future via a cell bank. In this way, one can retain knowledge already acquired. Rebirth can be either at a specified desired age or as a baby.

2. Cryogenics - in case of incurable disease, a person may elect to be deep frozen until a cure is found and then resume life at a later date.

3. Animated suspension - temporary stoppage of the bodily processes.

4. Teleportation via time machine - alternative to die in the past or in the future, or to re-live in the past or in a different geographic area or planet location, or on a planet where nothing ages.

5. DeLeon-Lorenzo Commission (DLC) for generic rejuvenation process to retard aging.

6. Form change - may elect to change into any form after death - liquid, solid, age, cosmic, light, etc.

7. Spirit body - may elect to live as a spirit body in other communities and planets, which the physically alive cannot see.

8. Old-fashioned dying - as in the ancient past, dying via a style and desire for a painless and fearless death.

Time-Traveling - some conversations center on time travel. One friend went back to witness the geologic volcanic creation of Kauai. Another went into the future and visited planet "Infinus" in the 3rd Galaxy 30° from the Third moon of Jupiter. There he found new vegetation sources that can be utilized for food.

Sharks - the dolphin community is filled with shark talk. Elua says sharks are still a mystery - they are believed to have maintained their dinosaur attitude throughout the evolution of mankind and dolphinkind.

Optimus, the Blue Whale, presiding head of worldwide government - he is searching for a mate, as there are very few blue whales left. Optimus is promoting interspecies communication which will extend from earth into the cosmos. This was the issue which got him elected.

Fashion News - the latest hairstyle is clone-green hair shaped like a dorsal fin. Total nudity has finally come into its own. In the area of jewelry, pearls are out and pine needles and leaves are "in".

Genetics - some people have chosen to surgically become cross-species. These people are capable of growing a fluke for underwater propulsion.

Communication with Plants - scientists are developing ways to communicate with trees and results are positive - the trees seem to be responding.

Insect Problem - the insect community is in revolt because they are tired of being stepped on, swatted, and squished.

Architecture - houses being round, there are no longer corners in homes. Gargoyles are back in style as building adornments. New shopping malls are being developed. Two of the most popular types are the floating mall and the flying mall.

Knowledge of Four-Year Olds Today - most 4-year old humans have what would formerly have been called a secondary level of education. They have acquired some degree of quantitative math in the process of learning decision-making qualities. Some of their learning is programmed through sleep learning processes. They are familiar with computers, having been given one at birth or creation (depending on their mode of coming into being). They are able through training or with the aid of educational drugs to induce different states of consciousness. Each educational program has a designated level of achievement and goal orientation with an individual option to progress further. If a child is programmed for the ultimate, she/he will continue education without the artificial separation of "play" and "education", the whole world being

seen as a learning situation. Education is largely dependent on environmental factors. Children are early taught, with the aid of bio-computer, to be health- and nutrition-oriented.

Late Night:

As most of the guests have a full 3-hour work day ahead of them, they begin to depart. As Kimo and Lani go off to bed, they begin to discuss some of the things they heard that night:

Kimo: Ain't it awful that the 2x7000 series computer failed last night, even though it had 80,000 fail-safe circuits!

Lani: Yeh, how come?

Kimo: They think it might be gamma-neutron rays from planet Alpha-Beta-7. They still have warfare up there and I think they might be thinking of an invasion.

Lani: Wow! Those guys seem to be living in the 20th century!

Kimo: Yeah, that's unfortunate, but they put up shields an hour ago and our envoy should be reaching them in about 15 minutes.

Lani: Oh yeah, but I wonder how our envoy will do - they still haven't solved the Niihau problem.

Kimo: Oh, what Niihau problem?

Lani: Didn't you hear about the primicrats?

Kimo: Yes, a little, but not much.

Lani: They're a radical group bent on sabotaging our interisland psychic communication network.

Kimo: Wow, why do they want to do that?

Lani: They're afraid that the demo-governs will make them conform to the rest of society. Their latest endeavor was jamming the spectrum with hyper-frequency. They jammed up all the telepathic channels.

Kimo: Oh, no wonder I was experiencing some problems last night with my conferencing. By the way, did you hear about the proposal that's up for the 0200 Delphi-7000 conference?

Lani: No, tell me about it.

Kimo: Seems that the technocrats want to limit the total amount of information available on a daily basis.

Lani: That's typical of the technocrats' attitude toward us - hope you'll oppose the maneuver.

Kimo: Yeah, I will, maybe the upcoming UNL series computer will solve the problem.

Lani: Well, I'm not too sure about that. Lately I've been having a dimmer view of technology's ability to solve all problems.

Kimo: Yes, but it is usually the humans who screw things up, not technology.

Lani: That's true to an extent, but it seems that we care more about machines and technology than about human values!

Kimo: I don't believe that! You're being reactionary and 20th Century minded!

Lani: Don't call me that, you lousy technocrat. See what your damn machines did to my drink - I ordered Cosmic Bliss but it gave me a Global Whirlwhind!

Kimo: See how dependent you are on the machine! What human values are you talking about?

Lani: I'm talking about the <u>right</u> of not having all these things shoved down my throat!

Kimo: Yeah, I guess so. Now I see what you mean. I sometimes wonder if we didn't opt the wrong things - maybe we did lose many things that made our species human - I don't know.

Lani: Maybe those people on Niihau have something after all.

Kimo: Yeah, thanks for the feedback. Nice to talk in Verbal sometimes, yeh?

Lani: Yeh, let's go to bed.

As they go off to bed, they chat happily about looking forward to seeing their first underwater sunrise in just a few hours.

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III FUTURE STUDIES

The three studies in this section will deal with communication policy and planning issues.

The first of these studies by Dan Wedemeyer employed a three-round Delphi procedure to identify the policy and planning issues that will require attention in the future. These issues cluster around the communication concepts of needs, rights, and supplies. The Delphi procedure synthesizes expert opinions -- in this case, 60 communication experts who live and work in Hawaii. This important study has just been accepted as a doctoral dissertation at the new Annenberg School of Communication at the University of Southern California in Los Angeles; Wedemeyer received the first doctorate awarded by that school.

The second study, headed by Jim Dator, focused on the problem of media literacy -- as contrasted with print literacy. The study included a series of seminars and workshops under the sponsorship of the Hawaii Committee for the Humanities. The findings of this study have strong implications for educational policy.

The third study, produced from the consultations and discussions held at the Hawaii Department of Planning and Economic Development, was summarized by David Jones.

FORECASTING FOR COMMUNICATION POLICY AND PLANNING IN HAWAII: A SUMMARY

Dan J. Wedemeyer

Introduction/Summary

This study addresses long-range forecasting of communication needs, supplies, and rights as inputs to the policy and planning process in the State of Hawaii.

The review of literature includes discussions of the requirement for incorporating a feedforward control device in policy and planning activities; an overview of communication policy and planning activities; a communication paradigm involving needs, resources and rights; and, application of Delphi as a method in long-range communication policy and planning.

Three rounds of Delphi inquiry were conducted utilizing 60 communication experts in the State of Hawaii. The experts were matched into pairs on the basis of responses to self-rating forms and randomly assigned to one of two groups. The experts in both groups were asked to estimate the 1976, 1991, 2006 levels of communication need, supply, and right for 24 communication concepts, and the years by which there would be a 10%, 50%, and 90% chance that each of the 17 communication-related events will have occurred.

The consistency of the final round forecasts were tested by comparing the results of the two groups. In addition, a post-inquiry assessment was administered to the participants. From these measures, it was concluded that the Delphi method proved to be a valid and reliable communication technique for ascertaining future forecasts of communication developments. The experts indicated satisfaction, utility, and face validity of the results.

The study results provide specific trend level forecasts and rankings for 24 communication concepts for the years 1976, 1991, and 2006. The rankings reveal the relative importance ascribed to each communication need and right, as well as the availability of particular communication supplies.

Two indices, a policy urgency index (PUI) and a dynamics index (DI), were developed to indicate possible future imbalances and growth of each of the 24 communication needs, supplies, and rights over the 30 year period. These indices play a major "foresight" role in revealing particular areas that policy research and action should be undertaken. Among those requiring prompt attention due to imbalances were: openness to government, privacy, and citizen information. Those trends forecasted as most dynamic over the next 30 years include electronic message flows, mobile communication, and small groups (electronically interposed) communication.

Events forecasts supplement trend findings in that the occurrence or non-occurrence of each affects the levels and probabilities of other developments. Of the 17 events forecasted, those with the most impact include the 50% probability of an energy crisis (equal or greater than the crisis of 1973) occurring by 1980; a 50% probability of electronic home delivery of a newspaper by 1985; and 50% probability that Hawaiian Telephone Company will be replacing co-axial cables with optical fibers by 1990.

Three major recommendations were made. The first calls for establishing a data base regarding the ten most significant areas (as prescribed by the PUI and the DI). The second recommendation calls for the development of a cross-impact computer model utilizing the trend and event forecasts derived from the Delphi study. The final recommendation suggests that a communication and information section be drafted, publicly discussed, and incorporated into the 1979 Hawaii State Plan. The results of the study stimulated and strengthened the Hawaii communication policy and planning process by demonstrating the reliability of the Delphi forecasting method, and reduced uncertainty regarding future communication needs, supplies, and rights levels.

Approach to Study

Communication in the State of Hawaii is increasingly being regarded as an important and valuable resource. As a resource that can be created, it has both the potential of substituting for, and reducing the consumption of other diminishing, scarce or expensive resources. Communication, in this regard, can be considered a linking resource among all resource systems. Because of these and other inherent organizational characteristics, it becomes important that communication policies and plans be developed that:

(1) are comprehensive and long-range in nature; and,

(2) insure that social needs and rights are met by advancing configurations of technologies.

In order to accomplish these goals there is a need to develop a policy and planning framework that has at its core a systematic and ongoing analysis of the communication environment of the State. It is from this analysis that an information base for policy and planning can emerge. The data base development process must not only capture information concerning past and present needs, rights and available supplies, but must also provide insights into future communication developments and potential problems or issues.

Assumptions of the Study

In this study, I started with four basic assumptions as guidelines for designing my long-range communication policy and planning research. The first assumption is that communication is a natural resource in the State. As previously stated, it is a resource that can substitute for, or take on the characteristics of other diminishing or expensive resources. For example, you have heard of telecommunication-transportation tradeoffs. Communication can be used to reduce the consumption of energy while reducing the time and associated mental and physical hazards of commuting to and from work. In this instance, communication has assumed the "nature" of oil and time resources, to name but two. Other resource substitution examples can be provided, but the important thing is that the way in which we structure our societal pattern of communication (policy and planning) is presently very important and will be even more so in the future.

The assumption is that communication research, policy and planning must be treated holistically and systematically. One cannot separate communication resources from other resources in the environment. They are very interdependent.

The third assumption is that human communication needs and rights should be the basis for all technological decisions. In the past, we have tended to let technologies dictate what we "needed" or had the "right to" in the communication environment. From recent literature, I think that this approach is turning around somewhat, but we still have a long way to go.

The fourth assumption is that communication study, and resulting policies and plans must be increasingly regarded as long-range in nature. Many of the policy and planning decisions made today carry with them 20-30 year commitments. For instance, if Hawaii decides to allow the construction of another undersea cable system, we are committing ourselves to a 10-20 year arrangement in order to amortize the investment. Along with this we are committing ourselves to rate structures and technical capabilities that may not follow the declining costs or advancing capabilities of emerging systems. The assumptions that we fail to make in today's policy and planning decisions concerning future communication needs and rights are very inhibiting as we move into the future. Therefore, the more information we have concerning possible future environments (i.e., the less uncertainty) the more closely our policies and plans will match evolving human needs and rights.

The Policy and Planning Cycle

Using these four assumptions as guidelines, I have synthesized an approach to communication policy and planning.

In my study of long-range communication developments in Hawaii, I have initiated part of one policy cycle. The study was conducted jointly at the East-West Communication Institute and the Annenberg School of

Communication, University of Southern California. To gather information for the research, a first round of inquiries was sent out in November 1976 and the third and final round of surveys were received in May 1977. Please see the policy and planning cycle shown in Figure 1.

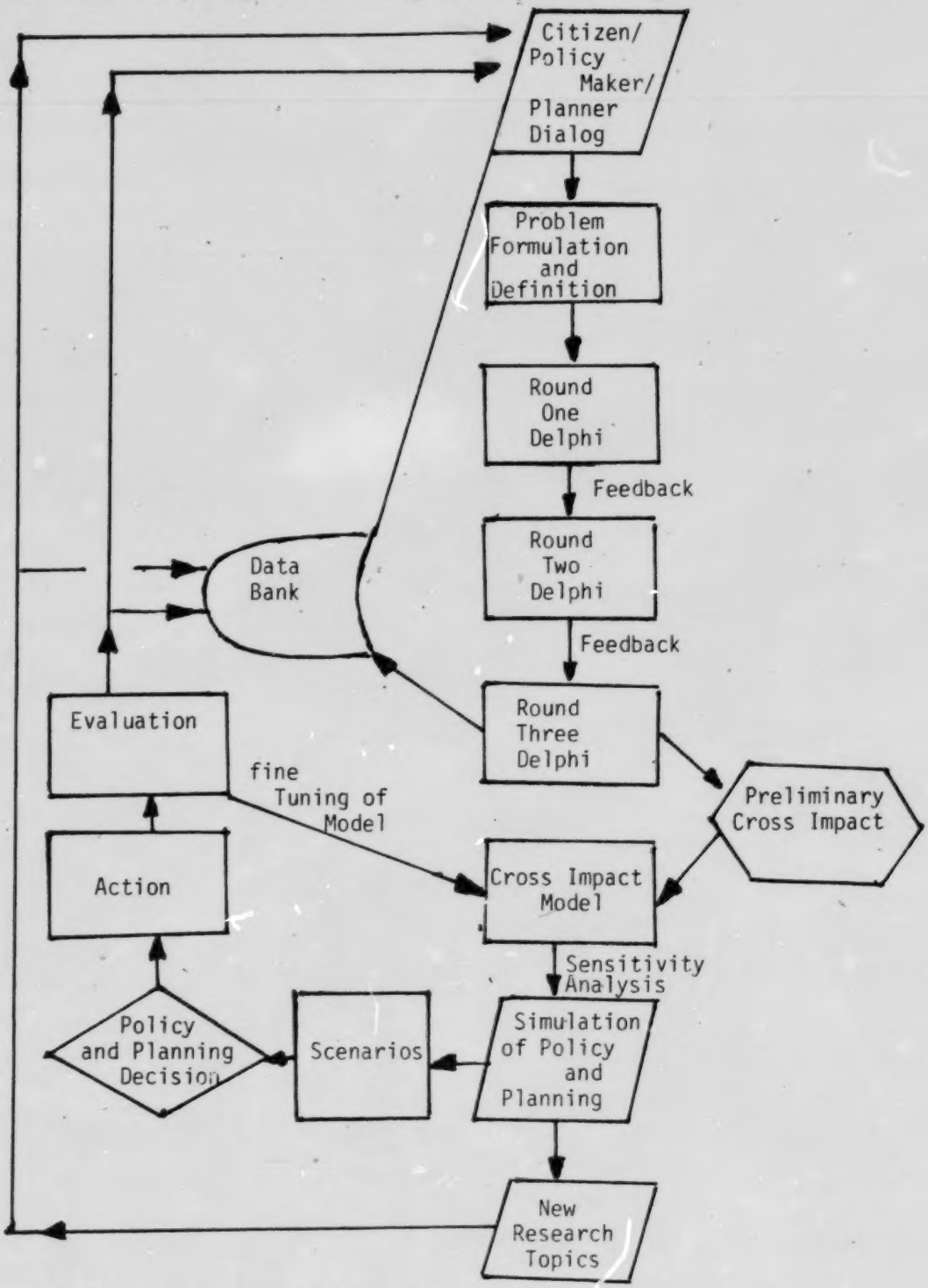


Figure 1. Policy and Planning cycle.

The process starts with a dialog between concerned citizens and those charged with policy and planning decisions. From this dialog, problems surface and are mutually defined. The information gained from this activity is used to plan research approaches and questionnaire designs. It was recommended that the results of the three rounds of Delphi inquiry (forecasts in the form of trend levels and event probabilities) be used as inputs into a cross-impact computer model. The model allows for (among other things) the simulation of policy options in order that decision makers can "view" possible consequences prior to policy actions. In addition, the cross impact model is capable of generating a large number of scenarios which may assist in policy and planning decisions. In short, the proposed policy cycle promotes the collection of information, poses difficult and interrelational tradeoff questions, suggests priorities for new research topics and simulates consequences of contemplated policy and planning actions. The process also provides information to citizens, and contributes to an information data base for ongoing public dialogs in subsequent cycles. The outcome of the process should be improved communication policies and plans for the State.

Working Definitions

As one might expect, defining and prioritizing communication needs and rights is very difficult. In order to remove some of the uncertainty, I have employed the following definitions in the study:

> BASELINE COMMUNICATION NEED: The level required to function without experiencing urgency, privation or destitution. It is NOT the bare minimum, nor is it a utopian level -- it is somewhere between these two extremes.

Take for example, the need for food. Using this definition, we are not talking about the lowest level that maintains life; at the same time, we are not talking about three nine-course dinners every day. The baseline need level is somewhere between these two extremes.

> SUPPLY LEVEL: The means, technology and/or personnel available to a SOCIETY, at a particular time period to serve communication needs. This does NOT refer to potentially available resources, only those available for use in the specified time period.

The definition requires less explanation than needs or rights. Essentially, the available supply refers to the resources (both human and technological) that are available to meet demonstrated (or possibly created) communication needs.

STRENGTH OF RIGHT: The intensity of that which is due to anyone in a SOCIETY by just claim, legal quarantees, moral principles, etc.

The rights dimension adds a previously excluded element of "humanism" to the otherwise market (i.e. supply and demand) driven policy and planning structure. It is similar to (and highly correlated with) communication needs, but clearly goes beyond needs in the moral and legal sense. During the inquiry rounds, rights came to mean the intensity of a society's demand that the communication supply be in balance with the need. In this study, rights are used as a weighting factor in determining policy urgency.

These were the working definitions that were provided to the experts in the first round. They were asked to forecast the specific levels of communication needs, supplies and rights for the State of Hawaii for the years 1976, 1991, and 2006.

Choice and Assignment of Experts

Sixty experts were chosen from a list of 500 persons who had attended communication conferences in Hawaii during the last five years. Incidentally, the list was the initial group to receive profile questionnaires for the Hawaii Communication Directory.

The sixty experts were divided into two panels of thirty members each. This was done by first matching pairs of experts by a self-rated profile and randomly assigning each member of the pair to a group. This technique is later to serve as a validity check on the final round forecasts. The two panels were also balanced in terms of educational levels, years of experience, self-ratings of expertise, etc. In addition, an effort was made to balance the panels by areas of employment (i.e. government, university, industry, etc.) and island location. Finally, there was a concern for representation from both sexes, although there is unquestionably an over-representation of males on both panels. A list of organizations and professions represented on the panels follows:

Organizations/Professions Represented

Hawaii Public Broadcasting
Clergy
Hawaii State Representative
Hawaii State Senators
Dillingham Corporation
Honolulu Advertiser
City and County of Honolulu
University of Hawaii-Manoa
University of Hilo-Hilo
Maui Community College
Windward Community College
C. Brewer and Company
PEACESAT
Hawaii Visitor Information Program
Private Advertising/PR Agency
State of Hawaii/D C Division
Honolulu Media Council
East-West Communication Institute
Hawaii State Commission on Year 2000
Hawaii Department of Planning and Economic Development
Hawaiian Telephone Company
Retired-Inventor, Professors, Researchers
Hawaii Council of Presidents
Private Television Producers

The Delphi Technique

Before I discuss the results, I should briefly explain the research method I employed in the study. It is called the Delphi Technique. The following description of the Delphi Technique comes from Gray and Helmer's "California Futures Study of Impacts for Transportation Planning" which may be obtained by writing to the Center for Futures Research, University of Southern California, Los Angeles 90007.

The Delphi technique is a method for obtaining a consensus of opinion from a panel of experts that avoids the "jury room" effect typical of face-to-face discussion. A panel of experts is presented with a questionnaire which asks them to respond, individually and preferably in numerical terms, to a series of questions about which information is sought. The responses to this initial questionnaire are collated and the results are fed back to the panelists. The panelists are then asked to review their previous estimates in the light of the distribution of responses to their colleagues. They are also asked to state their reasons for their estimates, particularly if these are near one or the other end of the distribution of panel responses. This process is repeated for several rounds until, typically, the spread of opinion among panelists is substantially reduced. The median of the last round of estimates is accepted as the consensus among the respondents.

The anonymous debate generated in the Delphi technique reduces the influence of psychological factors, such as specious persuasion, the unwillingness to abandon publicly expressed judgments, and the bandwagon effects of majority opinion. The Delphi process has proved particularly valuable in capturing expert opinion about the nature and likelihood of future events and trends.

My particular working definition of Delphi is: a method for structuring communication so that a consensus can be attained among large groups of experts on a complex problem. It characteristically has 2-4 rounds of questionnaires, either administered by mail or personal interview. Delphi was designed to be used with experts (i.e. it is NOT a random sample polling technique). All information is given anonymously in the sense that the participating experts do not know who else is on the panel, or at the very least no statement is identified with a particular panel member. Finally, all Delphi inquiries involve controlled feedback (usually group medians, interquartile ranges and rationale or clarification statements) between rounds.

Selected Developments

As Jim Dator noted earlier, when one starts to systematically investigate alternative futures, one of the ways it can be approached is by constructing questions concerning specific trends and events. In this particular study, the following developments were used:

DEVELOPMENTS IN COMMUNICATION NEEDS, RIGHTS AND SUPPLIES
IN HAWAII -- 1976-2006

TRENDS

T1 Mobile Communication
T2 Security Communication
T3 Openness in Government
T4 Citizen Information
T5 Two-Way, Interactive
T6 One-Way Communication
T7 Persuasive Communication
T8 Entertainment Communication
T9 Citizen Involvement Political Decisions
T10 Capital Investment in Communication Infrastructure
T11 Face-to-Face Communication
T12 Civil Defense Communication
T13 Electronic Message Flows
T14 Small Group Communication
T15 Citizen Participation/Local Community
T16 Self-Expression
T17 Education Communication
T18 Serendipitous Communication
T19 Privacy
T20 Cross-Cultural Communication
T21 Societal Communication in General
T22 Access to Means of Communication
T23 Monopolistic Control of Communication
T24 Anticipatory Communication Skills Development

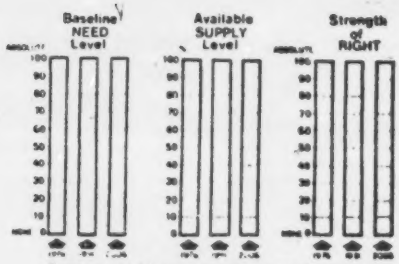
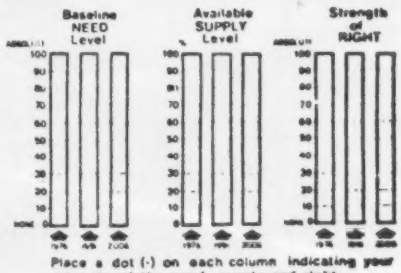
EVENTS

E1 Establishing of First Public Video Conferencing Center in Hawaii
E2 Utilization of Optical Fibers (Replacing Co-Axial Cables) by Hawaiian Telephone
E3 An Energy Crisis Equal to or Greater than 1973 Crisis
E4 25% of Hawaii's Homes have Installed a Digital Storage Device
E5 Establishing of "Dial-Up" Pay Television Service to Homes
E6 The Passage of Legislation Requiring a Telephone in Every Island Home
E7 The Passage of Legislation Requiring Rate Averaging (Telephone) for Hawaii
E8 First Occurrence of an Electronic Delivery of Newspaper to Island Home
E9 Occurrence of Electronic Home Polling (Not Telephone Polling) by State Government
E10 Legislation (Passed) that Establishes a Severe Tax ($500) on 2nd Family Car
E11 Establishment of Free Mass Transit on Oahu
E12 Occurrence of State Gasoline Rationing on Regular Basis
E13 Physical Est. of Neighborhood Communication/Work Center (Not Shopping Center)
E14 Statewide Requirement of "Keyboard Skills" in the Public Schools
E15 Passage of a State "Communication Bill of Rights"
E16 25% of all Shopping Transactions are Performed Remotely (Electronically)
E17 A Technical Breakthrough that Provides Inexpensive and Virtually Unlimited Spectrum Space

I was mainly concerned with communication concepts that perform general functions in Hawaii's society. These concepts (framed in trend and event questions) represent developments that will be potentially very important for the next thirty years in the State.

Questionnaire Design and Discussion of Rounds

The questionnaire was designed and pretested in order to facilitate easy comprehension and completion by the experts. A sample page follows:

	CONCEPT	DEFINITION	FORECASTS
T3.	Openness of Government	Open, prepared and posted agendas and provision for citizens to attend all government meetings.	 Place a dot (·) on each column indicating your estimate of the need, supply and right.
T4.	Citizen Information	Consumer information, schedules for services and events, legal medical and health information open and conveniently available to citizens.	 Place a dot (·) on each column indicating your estimate of the need, supply and right.

In each of the surveys the experts were given 24 communication concepts (e.g. mobile communication, privacy, security communication, etc.) and a working definition of each. They were asked to establish a "benchmark" level for 1976, and to project the levels for 1991 and 2006.

During the first round the experts had only their own intuitive feelings for the direction and intensity of the concept levels. The total number of responses for the first round was 49 out of 60 (second round responses were 30/57 and third round responses were 31/54). Each of the individual responses was entered onto a master graph and medians and semi-interquartile ranges (the middle 50% of the responses) were computed. In the second round the experts were asked to review the information supplied from the first round (i.e. the medians and interquartile ranges) and make their second round estimates. This time, if their estimate was outside the first round interquartile range, they were asked to justify their second round forecast in narrative form. The justification statements were to provide a rationale for their deviation from the group. Oftentimes an expert has access to special information that other members of the group do not have.

(Ranking by Means)

1976	1991	2006
75.16 = T11 Face-to-Face Communication	80.38 = T19 Privacy	85.66 = T4 Citizen Information
74.55 = T9 Citizen Involvement Pol. Dec.	79.82 = T9 Citizen Involvement Pol. Dec.	83.51 = T5 Two-Way Communication
72.93 = T19 Privacy	78.84 = T3 Openness in Govt.	83.24 = T9 Citizen Involvement Pol. Dec.
69.30 = T3 Openness in Govt.	77.41 = T11 Face-to-Face Communication	82.46 = T15 Citizen Part./Local Community
67.82 = T15 Citizen Party/Local Community	76.36 = T12 Civil Defense Communication	81.79 = T20 Cross-Cultural Communication
67.68 = T6 One-Way Communication	75.93 = T4 Citizen Information	80.48 = T19 Privacy
67.62 = T12 Civil Defense Communication	75.73 = T15 Citizen Part./Local Community	79.86 = T12 Civil Defense Communication
65.96 = T5 Two-Way Communication	75.34 = T5 Two-Way Communication	79.55 = T21 Societal Communication/Gen.
63.57 = T4 Citizen Information	72.89 = T6 One-Way Communication	79.16 = T3 Openness in Govt.
61.93 = T20 Cross-Cultural Communication	71.53 = T20 Cross-Cultural Communication	78.58 = T11 Face-to-Face Communication
61.00 = T21 Societal Communication/Gen.	70.74 = T21 Societal Communication/Gen.	76.68 = T6 One-Way Communication
60.83 = T16 Self-Expression	68.03 = T16 Self-Expression	75.53 = T10 Capital Invest./Comm. Infra.
51.06 = T8 Entertainment Communication	66.08 = T10 Capital. Invest./Comm. Infra.	75.03 = T17 Education Communication
50.45 = T10 Capital Invest./Comm. Infra.	59.23 = T8 Entertainment Communication	74.29 = T16 Self-Expression
38.81 = T17 Education Communication	57.68 = T17 Education Communication	67.93 = T13 Electronic Message
38.80 = T22 Access to Means/Comm.	52.96 = T24 Anticipatory Skills Dev.	67.80 = T24 Anticipatory Skills Dev.
36.19 = T18 Serendipitous Communication	50.93 = T14 Small Group Communication	65.85 = T14 Small Group Communication
35.87 = T24 Anticipatory Skills Dev.	49.76 = T22 Access to Means/Comm.	64.60 = T1 Mobile Communication
32.70 = T7 Persuasive Communication	48.12 = T13 Electronic Message	63.75 = T8 Entertainment Communication
31.13 = T2 Security Communication	46.10 = T2 Security Communication	62.40 = T22 Access to Means/Comm.
29.96 = T14 Small Group Communication	43.90 = T1 Mobile Communication	59.26 = T3 Openness in Govt.
24.60 = T1 Mobile Communication	39.00 = T18 Serendipitous Communication	41.11 = T18 Serendipitous Communication
24.58 = T13 Electronic Message	35.73 = T7 Persuasive Communication	34.80 = T7 Persuasive Communication
22.51 = T23 Monopolistic Control	24.10 = T23 Monopolistic Communication	25.10 = T23 Monopolistic Communication

COMMUNICATION SUPPLIES
(Ranking by Means)

1976	1991	2006
70.20 = T7 Persuasive Communication	80.27 = T6 One-Way Communication	87.10 = T6 One-Way Communication
70.03 = T6 One-Way Communication	75.53 = T7 Persuasive Communication	79.06 = T8 Entertainment Communication
61.68 = T11 Face-to-Face Communication	68.50 = T8 Entertainment Communication	78.10 = T5 Two-Way Communication
57.20 = T8 Entertainment Communication	67.23 = T12 Civil Defense Communication	76.53 = T7 Persuasive Communication
52.92 = T5 Two-Way Communication	65.67 = T5 Two-Way Communication	76.20 = T12 Civil Defense Communication
52.20 = T9 Citizen Involvement Pol. Dec.	64.57 = T9 Citizen Involvement Pol. Dec.	73.42 = T9 Citizen Involvement Pol. Dec.
51.06 = T12 Civil Defense Communication	63.10 = T11 Face-to-Face Communication	73.00 = T1 Mobile Communication
44.57 = T23 Monopolistic Control	56.60 = T4 Citizen Information	72.92 = T21 Societal Communication/Gen.
41.20 = T19 Privacy	56.00 = T20 Cross-Cultural Communication	72.43 = T20 Cross-Cultural Communication
40.53 = T16 Self-Expression	54.16 = T16 Self-Expression	71.96 = T4 Citizen Information
40.40 = T21 Societal Communication/Gen.	52.62 = T1 Mobile Communication	66.34 = T17 Education Communication
40.13 = T15 Citizen Participation	52.06 = T19 Privacy	65.96 = T3 Openness in Govt.
38.83 = T20 Cross-Cultural Communication	51.76 = T10 Capital Invest./Comm. Infra.	65.80 = T10 Capital Invest./Comm. Infra.
38.22 = T10 Capital Invest./Comm. Infra.	51.32 = T21 Societal Communication/Gen.	64.58 = T2 Security Communication
37.73 = T18 Serendipitous Communication	51.20 = T3 Openness in Govt.	64.33 = T11 Face-to-Face Communication
37.54 = T3 Openness in Govt.	51.06 = T15 Citizen Party/Local Community	64.25 = T13 Electronic Message Flow
36.82 = T4 Citizen Information	49.76 = T23 Monopolistic Control	61.32 = T14 Small Group Communication
29.76 = T1 Mobile Communication	49.03 = T2 Security Communication	58.79 = T15 Citizen Part./Local Community
23.96 = T2 Security Communication	48.60 = T17 Education Communication	58.35 = T16 Self-Expression
23.30 = T22 Access to Means/Comm.	48.26 = T18 Serendipitous Communication	55.00 = T24 Anticipatory Skills Dev.
22.83 = T17 Education Communication	40.17 = T14 Small Group Communication	54.85 = T19 Privacy
20.46 = T24 Anticipatory Skills Dev.	39.49 = T24 Anticipatory Skills Dev.	54.05 = T22 Access to Means/Comm.
16.75 = T14 Small Group/Elect.	38.06 = T22 Access to Means/Comm.	53.75 = T23 Monopolistic Control
13.46 = T13 Electronic Message	38.05 = T13 Electronic Message	52.72 = T18 Serendipitous Communication

These statements introduce new information into subsequent rounds. All justification statements were kept anonymous, but were fed back to each group (along with the second round medians and interquartile ranges) for the third and final round of estimates. The third round required the experts to review the justification statements, the group medians and interquartile ranges and make a final forecast for each need, supply and right level.

At the end of the three rounds, the estimates of the two panels were combined and the resulting means, medians and interquartile ranges were checked for consistency. One hundred eighty-eight of the 216 trends (87%) met criteria for consensus; 31 of 51 events (61%) met the criteria. A consensus is attained when 50% of all responses (falling on either side of the median) fall 20 or fewer points apart on the 100 point scale for trends, and 50% of all responses fall plus or minus 3 years from the median for events.

The experts co-operated very well, considering the amount of time required for each round (estimated at about 1-3 hours) and the small reward offered for their participation. I must commend them all.

Results of the Delphi Inquiry

The final round means were computed for each of the 24 concepts. These means represented the experts' final forecasts for each trend for the years -- 1976, 1991, and 2006. These means were then rank-ordered for needs, supplies and rights. These rankings appear as follows:

STRENGTH OF COMMUNICATION RIGHT
(RANKING BY MEANS)

1976		1981		2016	
85.80 = T12	CIVIL DEFENSE COMMUNICATION	87.06 = T12	CIVIL DEFENSE COMMUNICATION	88.23 = T12	CIVIL DEFENSE COMMUNICATION
82.57 = T9	CITIZEN INVOLVEMENT POL. DEC.	85.53 = T9	CITIZEN INVOLVEMENT POL. DEC.	87.86 = T4	CITIZEN INFORMATION
82.03 = T19	PRIVACY	85.31 = T6	ONE-WAY COMMUNICATION	87.65 = T6	ONE-WAY INFORMATION
81.36 = T3	OPENESS IN GOVT.	84.89 = T4	CITIZEN INFORMATION	87.10 = T3	OPENESS IN GOVT.
81.24 = T6	ONE-WAY COMMUNICATION	84.83 = T3	OPENESS IN GOVT.	87.07 = T9	CITIZEN INVOLVEMENT POL. DEC.
80.72 = T4	CITIZEN INFORMATION	84.30 = T19	PRIVACY	85.50 = T19	PRIVACY
79.03 = T11	FACE-TO-FACE COMMUNICATION	82.03 = T11	FACE-TO-FACE COMMUNICATION	84.51 = T16	SELF-EXPRESSION
77.93 = T16	SELF-EXPRESSION	81.58 = T16	SELF-EXPRESSION	83.81 = T21	SOCIETAL COMMUNICATION/GEN.
76.86 = T15	CITIZEN PART./LOCAL COMUNITY	80.50 = T15	CITIZEN PART./LOCAL COMUNITY	83.43 = T15	CITIZEN PART./LOCAL COMUNITY
76.06 = T20	CROSS-CULTURAL COMMUNICATION	79.62 = T21	SOCIETAL COMMUNICATION/GEN.	83.32 = T5	TWO-WAY COMMUNICATION
74.66 = T5	TWO-WAY COMMUNICATION	78.64 = T5	TWO-WAY COMMUNICATION	82.24 = T11	FACE-TO-FACE COMMUNICATION
73.81 = T21	SOCIETAL COMMUNICATION/GEN.	78.06 = T20	CROSS-CULTURAL COMMUNICATION	80.86 = T20	CROSS-CULTURAL COMMUNICATION
65.28 = T8	ENTERTAINMENT COMMUNICATION	67.16 = T8	ENTERTAINMENT COMMUNICATION	75.53 = T17	EDUCATION COMMUNICATION
58.50 = T10	CAPITAL INVEST./COMM. INFRA.	66.30 = T22	ACCESS TO MEANS/COMM.	74.66 = T22	ACCESS TO MEANS/COMM.
56.03 = T22	ACCESS TO MEANS/COMM.	64.82 = T10	CAPITAL INVEST./COMM. INFRA.	70.74 = T24	ANTICIPATORY SKILLS DEV.
53.16 = T18	SERENDIPITOUS COMMUNICATION	63.36 = T17	EDUCATION COMMUNICATION	70.51 = T8	ENTERTAINMENT COMMUNICATION
51.95 = T24	ANTICIPATORY SKILLS	62.64 = T24	ANTICIPATORY SKILLS DEV.	68.78 = T10	CAPITAL INVEST./COMM. INFRA.
51.23 = T17	EDUCATION COMMUNICATION	57.18 = T14	SMALL GROUP COMMUNICATION	68.09 = T14	SMALL GROUP COMMUNICATION
43.31 = T14	SMALL GROUP COMMUNICATION	55.00 = T18	SERENDIPITOUS COMMUNICATION	64.32 = T13	ELECTRONIC MESSAGE
42.64 = T7	PERSUASIVE COMMUNICATION	54.28 = T13	ELECTRONIC MESSAGE	62.65 = T1	MOBILE COMMUNICATION
41.02 = T2	SECURITY COMMUNICATION	51.87 = T1	MOBILE COMMUNICATION	58.63 = T2	SECURITY COMMUNICATION
38.75 = T13	ELECTRONIC MESSAGE	50.07 = T2	SECURITY COMMUNICATION	56.45 = T18	SERENDIPITOUS COMMUNICATION
36.85 = T1	MOBILE COMMUNICATION	49.54 = T7	PERSUASIVE COMMUNICATION	49.24 = T7	PERSUASIVE COMMUNICATION
24.28 = T23	MONOPOLISTIC CONTROL	25.79 = T23	MONOPOLISTIC CONTROL	29.10 = T23	MONOPOLISTIC CONTROL

I do not think that one could conclude from the data that these lists are in exact order from highest to lowest need, supply or right. However, I think that it is reasonable to conclude that the top five or ten are of higher manuscript (in the case of need and right) or availability (for supply) than the bottom of five or ten. Given limited resources in policy and planning for communication in the State, it would be reasonable to take action in the form of either research, or policy and planning decisions on the top ranking concepts before taking action on the bottom ranking concepts.

The Policy Urgency Index

The following equation was used to determine which concepts were most "out of balance" in respect to supplies, meeting needs as weighted by rights. The equation is as follows:

(NEEDS-SUPPLY) X STRENGTH OF RIGHT = POLICY URGENCY

Simply stated, the need level minus the supply level leaves a quantity which is either an unmet or over-met communication need. This quantity multiplied by the strength of the right yields a quantity called the Policy Urgency Index (PUI). The rank order of each of these PUI quantities provides an indication of which of the concepts are most "out of balance" when weighted by human rights. The rankings for 1976, 1991 and 2006 are as follow:

POLICY URGENCY INDEX
(Rankings)

(NEED -- SUPPLY) X RIGHT = PUI

1976		1991		2006	
2605.60 = T3	Openness in Govt.	2387.3 = T19	Privacy	2191.3 = T19	Privacy
2602.8 = T19	Privacy	2348.7 = T3	Openness in Govt.	2058.7 = T7	Persuasive Communication
2159.2 = T4	Citizen Information	1985.93 = T15	Citizen Part./Local Community	1891.35 = T15	Citizen Part./Local Comm.
2128.2 = T15	Citizen Part./Local Comm.	1971.69 = T7	Persuasive Communication	1303.9 = T16	Self-Expression
1896.4 = T9	Citizen Involvement Pol. Dec.	1640.9 = T4	Citizen Information	1203.6 = T4	Citizen Involvement
1756.9 = T20	Cross-Cultural Communication	1546.22 = T21	Societal Communication/Gen.	1171.92 = T11	Face-to-Face Communication
1599.9 = T7	Persuasive Communication	1304.3 = T9	Citizen Involvement Pol. Dec.	1149.72 = T3	Openness in Govt.
1581.97 = T16	Self-Expression	1212.27 = T20	Cross-Cultural Communication	1079.5 = T8	Entertainment Communication
1520.4 = T21	Societal Communication/Gen.	1176.85 = T11	Face-to-Face Communication	913.3 = T6	One-Way Communication
1400.8 = T12	Civil Defense Communication	1174.4 = T16	Self-Expression	905.47 = T24	Anticipatory Skills Dev.
1065.3 = T11	Face-to-Face Communication	892.10 = T17	Education Communication	855.02 = T9	Citizen Involvement Pol.Dec.
973.6 = T5	Two-Way Communication	862.55 = T24	Anticipatory Skills Dev.	833.75 = T23	Monopolistic Control
868.46 = T22	Access to Means/Comm.	799.23 = T10	Capital Invest./Comm. Infra.	756.8 = T20	Cross-Cultural Communication
818.6 = T17	Education Communication	794.85 = T12	Civil Defense Communication	669.22 = T10	Capital Invest./Comm. Infra.
801.2 = T24	Anticipatory Skills Dev.	780.4 = T5	Two-Way Communication	656.3 = T17	Education Communication
715.4 = T10	Capital Invest./Comm. Infra.	716.04 = T22	Access to Means/Comm.	622.66 = T22	Access to Means/Comm.
572.1 = T14	Small Group Communication	659.70 = T23	Monopolistic Control	555.6 = T21	Societal Communication/Gen.
534.7 = T23	Monopolistic Control	647.50 = T6	One-Way Communication	525.0 = T1	Mobile Communication
430.9 = T13	Electronic Message	629.28 = T8	Entertainment Communication	486.1 = T18	Serendipitous Communication
400.8 = T8	Entertainment Communication	615.25 = T14	Small Group Communication	460.76 = T5	Two-Way Communication
295.97 = T2	Security Communication	514.05 = T13	Electronic Message Flows	322.92 = T12	Civil Defense Communication
190.9 = T6	One-Way Communication	462.3 = T1	Mobile Communication	311.91 = T2	Security Communication
189.46 = T1	Mobile Communication	179.3 = T18	Serendipitous Communication	309.1 = T14	Small Group Communication
81.86 = T18	Serendipitous Communication	3.5 = T2	Security Communication	256.6 = T13	Electronic Message

In order to exemplify how the PUI is useful in pointing out potential "imbalance-oriented" issues, the following sections will provide discussions on the top three ranking 1991 concepts.

Privacy:

Defined as the control over information concerning oneself, privacy is, and will continue to be an important policy issue for the next 15-30 years. Both the need and right to privacy was projected to be very high and rising only slightly over the forecast period, while the 1976 supply was forecasted as low and increasing slightly.

The evolving privacy problem is most identified with centralized electronic data systems that are increasingly capable of maintaining and distributing personal information. The threat of improperly used or incorrect personal information are central concerns of privacy

policy matters. In the second round discussion participants anonymously indicated that the "courts themselves are unclear on what should or should not be divulged" and that "social welfare" programs will contribute to the loss of personal privacy.

Representing a different perspective on the issue, one participant argued that "as the ability to monitor everything grows, it may well be accompanied with the realization that if we all know everything about each other, then it does not really matter who knows what -- we may well become a 'small town' in this sense."

The U.S. federal government has responded to this evolving policy problems by passing the 1974 Privacy Act, by establishing a Domestic Council on the Right to Privacy and by conducting several senate hearings and issuing reports. Actions concerning limitations of personal information disclosure, inspections and correction of personal files have been taken. Excluding credit information, these actions have not addressed privacy issues with respect to collecting information in the private sector where many policy questions concerning access, limitations and rights will remain to be addressed.

Areas of research and data collection should include those concerning credit records, medical and insurance records, employment and personnel records, banking and financial records, extended use of social security numbers, State information laws and the like.

Future privacy policies will need to address such problems as use and abuse of personal data, standards for accuracy and bias of captured and transferred information, data havens, mechanisms to monitor and correct inproprieties, etc. As information is increasingly viewed as the currency in the communication era, the collection, storage and distribution of this valuable resource will no doubt be the subject of much policy debate and action.

Openness in Government:

Defined as open, prepared and posted agendas and the provision for citizens to attend all government meetings, openness in government is not entirely unrelated to the privacy issue. Forecasts for this concept reflected a high and rising need, a high and relatively stable right, and a low and somewhat rising supply. Imbalances between need and supply are forecasted to decrease somewhat over the next thirty years, although openness in government still remains in the top ten most imbalanced issues in 2006.

The participant's discussion on this issue reflected concern that although the state of Hawaii has a "sunshine law," people do not necessarily know of its existence and do not take full advantage of it. There are "fewer" secret meetings under "sunshine," but the problem is now one of logistics, i.e., where and when the meetings are held. Statements concerning (or questioning) a citizen's need to know about all government meetings; and, the need for citizens to selectively choose areas of interest and concern were also evidenced in the discussion. The supply problem of "openness in government" concerns providing the means on a selective and equitable basis for access to government proceedings. "Congressional history," as one participant points out, "has shown a need for non-public meetings if work is to be done." Another points out that "all government meetings cannot and shall not be open to the public."

Polarization on this issue is already occurring. Some of the policy problems to be addressed will concern such issues as degree and implementation of governmental openness, privacy rights of those serving in the government, equitable mechanisms for opening participation to all socio-economic levels, access to government records, logistics of meetings and relative costs of openness and closedness in government.

As the Policy Urgency Index indicated, the issue of openness is one which will no doubt require considerable policy attention in the next 15 years. Those advocating individual rights of access and participation will be confronted with arguments of national or state security and efficiency. Alternatives for providing wider access to, or openness of, government will no doubt look to such alternatives as television, telephone polling and wider access to federal or state data bases. Implementing these alternatives (or others) will necessitate open debate, tradeoffs and policy decisions all of which require a broader understanding of this complex issue.

Citizen Participation in Local Community

This high ranking 1991 issue addresses social and cultural interactions of people that results in promoting a sense of community or neighborhood. Although this issue does not totally exclude the previous concerns for openness in government and privacy, it focuses on participation at a local level and can be viewed more in social or cultural terms than political. The need and right forecasts for this concept were significantly higher than the projected supply levels. Problems pointed out in the participant's comments involved the real or potential reduction of community interaction by electronic communication media and that few channels exist by which neighborhood people can be drawn together. Participants

indicated that technology promotes "no physical presence" and "spreads social fear" which actually inhibits people from contacting each other.

In contrast, others point out that people are not necessarily interested in participating in local community, even if the means were available. Comments were offered that two-way systems would promote social interaction, but that this interaction would not necessarily be locally-oriented. Some participants felt that future social interactions would be oriented toward common or professional interests and be state or national in scope.

The real issues here may be the identification, accessibility and connectability of people holding particular common interests. New "tele-communities" may evolve that do not conform to previous definitions of "local" or "neighborhood." This development is highly dependent upon the configurations of electronic communication networks and costs. Issues concerning who will provide, control and profit from these networks will no doubt arise and will require state and federal decisions the scope of which will affect the very fabric of Hawaii's future society.

In summary, the PUI is the mechanism that can be used to indicate priorities for research or data collection which, in turn, should indicate what specific policy or planning actions should be taken. The PUI reduces uncertainty by providing an "early warning" of potential problems before crises occur. In this regard, it serves the requirements of a feedforward control system.

The Dynamics Index

The final index developed concerned the dynamics of each concept need, supply and right over time. By substracting the 1976 level from the projected 2006 level, a growth index can be derived. The equations are as follow:

NEEDLEVEL 1976 - NEEDLEVEL 2006 = NEEDSGROWTH

SUPPLYLEVEL 1976 - SUPPLYLEVEL 2006 = SUPPLYGROWTH

RIGHTSLEVEL 1976 - RIGHTSLEVEL 2006 = RIGHTSGROWTH

NEEDSGROWTH + SUPPLYGROWTH + RIGHTSGROWTH = DYNAMICS INDEX (DI)

The dynamic index provides an indication of which concepts will exhibit the most growth over time and, therefore, are most likely to require policy and planning attention. The dynamics rankings are as follows:

DYNAMICS INDEX

(RANKING BY UNITS OF CHANGE)

$\Delta_{NEED\ 76-06} + \Delta_{SUPPLY\ 76-06} + \Delta_{RIGHT\ 76-06} = TOTAL\ N/S/R$

1976 - 2006		1976 - 2006		1976-2006		1976-2006	
NEED		**SUPPLY**		**RIGHT**		**TOTAL N/S/R**	
45 = T13	Electronic Message Flow	51 = T13	Electronic Message	26 = T13	Electronic Message	120 = T13	Electronic Message
39 = T1	Mobile Communication	46 = T14	Small Group Communication	26 = T1	Mobile Communication	108 = T1	Mobile Communication
37 = T17	Education Communication	44 = T17	Education Communication	25 = T14	Small Group Communication	106 = T14	Small Group Communication
36 = T14	Small Group Communication	43 = T1	Mobile Communication	24 = T17	Education Communication	105 = T17	Education Communication
32 = T24	Anticipatory Skills Dev.	41 = T2	Security Communication	19 = T24	Anticipatory Skills Dev.	86 = T2	Security Communication
28 = T2	Security Communication	35 = T4	Citizen Information	18 = T22	Access to Means/Comm.	86 = T24	Anticipatory Comm.
25 = T10	Capital Invest./Comm. Infra.	35 = T24	Anticipatory Skills Dev.	17 = T2	Security Communication	73 = T22	Access to Means/Comm.
24 = T22	Access to Means/Comm.	34 = T20	Cross-Cultural Comm.	10 = T21	Societal Communication/Gen.	64 = T4	Citizen Information
22 = T4	Citizen Information	32 = T21	Societal Communication/Gen.	10 = T10	Capital Invest.	62 = T10	Capital Invest./Infra.
20 = T20	Cross-Cultural Comm.	31 = T22	Access to Means/Comm.	9 = T5	Two-Way Communication	60 = T21	Societal Communication/Gen.
18 = T21	Societal Communication/Gen.	28 = T3	Openness in Govt.	7 = T4	Citizen Information	58 = T20	Cross-Cultural Communication
18 = T5	Two-Way Communication	27 = T10	Capital Invest./Comm. Infra.	7 = T7	Persuasive Communication	53 = T5	Two-Way Communication
15 = T6	One-Way Communication	26 = T5	Two-Way Communication	7 = T16	Self-Expression	44 = T3	Openness in Govt.
15 = T15	Citizen Part./Local Comm.	25 = T12	Civil Defense Communication	7 = T19	Privacy	41 = T15	Citizen Participation
14 = T16	Self-Expression	22 = T8	Entertainment Communication	6 = T3	Openness in Govt.	40 = T12	Civil Defense Communication
12 = T8	Entertainment Comm.	21 = T9	Citizen Involve. Pol. Dec.	6 = T6	One-Way Communication	39 = T16	Self-Expression
12 = T12	Civil Defense Comm.	19 = T15	Citizen Participation	5 = T8	Entertainment Communication	39 = T8	Entertainment Communication
10 = T3	Openness in Govt.	18 = T16	Self-Expression	5 = T23	Monopolistic Control	38 = T6	One-Way Communication
9 = T9	Citizen Involve. Pol. Dec.	17 = T6	One-Way Communication	5 = T9	Citizen Involve. Pol. Dec.	35 = T9	Citizen Involve. Pol. Dec.
8 = T19	Privacy	13 = T19	Privacy	4 = T20	Cross-Cultural Comm.	24 = T19	Privacy
5 = T18	Serendipitous Comm.	12 = T18	Serendipitous Comm.	3 = T18	Serendipitous Communication	20 = T18	Serendipitous Communication
3 = T11	Face-to-Face Communication	6 = T7	Persuasive Communication	3 = T11	Face-to-Face Communication	15 = T7	Persuasive Communication
3 = T23	Monopolistic Control	5 = T23	Monopolistic Control	3 = T19	Privacy	13 = T23	Monopolistic Control
2 = T7	Persuasive Communication	3 = T11	Face-to-Face Communication	3 = T12	Civil Defense Communication	9 = T11	Face-to-Face Communication

In order to examine the utility of the Dynamics Index (DI) the following sections will describe some of the possible problems and policy considerations that may be associated with three of the most 1991 dynamic communication concepts.

Electronic Message Flow

Electronic message flow ranked highest in need, supply and right shifts over the next thirty years. This broad concept involves such services as electronic mail, electronic funds transfer and a host of other network information services.

In the last decade, a number of trends have set the stage for these rapidly growing areas. The declining costs of computer processing and memory have and will continue to give rise to new electronic business and home services. Paralleling and accelerating this growth is the rising availability of data communication services which have also declined in cost, while showing dramatic increases in availability, capacity and reliability. As indicated by the Dynamics Index, the stage is set for rapid growth in this relatively recent communication development. The most obvious issues arising from this rapidly accelerating needs, supply and rights growth are those associated with electronic mail and electronic funds transfer.

Electronic mail was the most discussed topic in the participant's second round justification statements. The increasing costs of energy and labor are seriously impacting traditional mail services. Electronic data and image distribution are already reducing traditional mail volumes and are projected to increase dramatically over the next 30 years. Although obviously not confined to a state issue, electronic mail obviously holds especially important economic and social implications for the state of Hawaii.

Initially, the issue will concern who will offer these new electronic mail services. Should the U.S. Postal Service supply all, part, or none of the service? Should, as some suggest, private carriers assume the responsibilities, capital investment and risk of these new services? Once settled, what mechanisms or standards must be established that will assure privacy, equity and universality of service at a fair cost. What combination (configurations) of services could (should) be offered? In the initial stages, should the mail be handled electronically between major nodes of a network with local delivery left to postal carriers, or should it be universally delivered point-to-point by electronic home and office terminals? What of the unemployment and hardware costs attached to the latter option? These and other policy questions will no doubt confront policy makers in the next 15-30 years.

Electronic banking procedures and funds transfers are increasingly being adopted by banks, savings and loans, credit bureaus, and merchandizing outlets. Whether this means a check-less/cashless society remains to be seen and is dependent upon a number of macro-policy decisions. What is most probable is that citizens will experience less check and cash transactions due to electronic funds systems, point of sale terminals, automatic tellers, and automatic clearinghouses.

This creates the need for establishing policy guidelines and regulations that will address such issues as competition, accessibility of credit information, privacy, and security in these new electronic financial systems.

Although the PUI did not indicate imbalances in electronic message flows (i.e., the needs/supply/and right were forecasted as moving in accordance with each other), the projected rapid growth of electronic message flow make it an extremely likely policy era. Research and data collection activity should be initiated, before these complicated issues become critical and policy decisions are required.

Mobile Communication

This highly dynamic concept involves such services as marine and aircraft communication, two-way voice and data terminals connected via telephone networks and located in pocket or vehicle, personal paging, mobile facscimile, etc. The forecasts for growth in these areas can be treated as a "technologically driven future." That is, the need and right followed slightly behind the forecast for the supply over the 38 year period. Widespread future use of non-stationary means to communication was viewed by the participants as corporate - rather than consumer-oriented. Police and other emergency services (along with marine and aircraft usage) were indicated as having "genuine needs" although it was mentioned that personal communication needs, now satisfied by the telephone, will be met by small "personal communicators" by 2006.

The widespread introduction and utilization of mobile radio-telephone will create the need for developing other spectrum resources, or become much more efficient in using the present one. This requires extensive systems studies and networking expertise and may involve the difficult policy decision of reallocating present broadcast spectrum for mobile use.

Although not specifically mentioned by the participants, direct broadcast satellite, accompanied by more efficient spectrum use, may provide a viable alternative to serving land-based mobile systems. This is already proving to be useful in marine and air mobile communication. In the longer term, alternatives such as shifting to broadband optical fiber networks for television, radio, and video telephones may release a significant amount of spectrum

space for mobile use.

Obviously, any shift of this scope would require appropriate state and federal policy action and would most certainly be dependent upon actions and agreements made at the forthcoming World Administrative Radio Conference (WARC) in 1979.

In summary, the DI has indicated rapidly shifting needs, supplies, and rights with respect to mobile communication over the next 30 years. Policy action in this regard require understanding complex social, economic and technological tradeoffs. It is in the best interest of the citizens of Hawaii that information bases be established that can assist in these likely policy decisions.

Small Group Communication

The definition employed here involves 3-20 persons that are electronically-interposed via computer, telephone or video links. This concept can be generally regarded as "teleconferencing" and is dependent upon available systems, techniques, transportation costs, training, and other psychological and social variables. The available supply was seen by the participating experts as dependent upon decreasing costs and capabilities of electronic equipment, combined with advanced communication skills.

In the shorter term, i.e, the next 15 years, the most widely used teleconferencing techniques will most likely involve voice, computer and video respectively. Each of these forms have distinct advantages and limitations and require differing policy guidelines, technological configurations, cost structures and skills. One often mentioned advantage of each teleconferencing medium is the potential for relatively large scale substitution of communication for increasingly expensive (many times non-essential) transportation.

Widespread adoption of teleconferencing will no doubt be affected by the costs and availability of alternative modes of communication/transportation, and as well by the degree that dehumanizing factors can be overcome in hardware and software design. The office of the future will be increasingly characterized by electronically-linked individuals working in decentralized locations. Once again it is in the best interest of the state of Hawaii to compile policy-oriented data and research in order to prepare for these difficult, but likely policy developments.

The DI is an important indicator of potential policy problems associated with rapid growth. The more dynamic a concept (i.e., the higher the change/unit of time), the less lead-time there is available to correct an evolving crisis situation. Therefore, those areas reflecting high overall dynamics rankings require greater

attention (monitoring). It is this alerting function, provided by the Dynamics Index, that reduces some of the uncertainty in the communication policy and planning process.

The Media Literacy Report

James Dator

Introduction

There is a very important discussion taking place--one which needs to be brought more clearly into focus within the Hawaiian public educational policy context--between persons who feel that traditional reading, writing, and computational skills are the necessary and sufficient basis of a formal educational system, and those who feel that the growing dominance of electronically-based communication systems (especially but not exclusively meaning here film, video, radio, phonograph records and audio tapes, and computers) requires that the acquisition of both "reading" and "writing" skills in these newer media is at least as important as learning to read and write in conventional English.

To deny students comprehensive education in these media, some people believe, is to leave them essentially "illiterate" vis-a-vis the dominant culture of communication around them. Others, believers in the primacy of print, deny that electronic communication technologies should (or do) play an important role in our intellectual and cultural lives, and that all truly valuable knowledge must continue to be based upon the written word.

The objective of this project was to create a series of public forums whereby broad and open discussion of the following questions could be undertaken:

- What place should instruction in the use of electronic communications technologies have in our formal public educational system?

- What is the relationship between what we "know" and the symbols we use to acquire and communicate that knowledge?

- Can a person be humanely educated in the modern world if he/she is unable critically to "read" and effectively to "write" in the dominant communication technologies around him/her?

- Are basic educational rights being denied students who are not instructed in the humane use of the newer media? Or, to the contrary, is there nothing of fundamental significance to be gained in learning to use and to evaluate the use of the newer media--in fact, are the newer media positively inimical to the purposes and values of the humanities?

Media Literacy Workshops

There were four public workshops at which technical information on the public policy issue was given and discussed.

Does Television Rot the Brain?

Professor Edmund Volkart, Professor of Sociology, University of Hawaii, and author of "Learning versus Entertainment--Values in Collision," argued that "Learning Values" (the attitudes and pre-disposition necessary for logical thought) can only be acquired and exercised through reading and writing. Because today's children see so much television--which is based on "Entertainment Values" and because some schools and teachers try to utilize audio-visual media which lessens still more students' acquisition of "Learning Values," it is not much of an exaggeration to say that television does in fact rot the brain.

Robert Cirino, Instructor in the Department of English, University of Hawaii, Manoa, and author of several books on the political control of mass media, took the position that, whether or not television per se was inimical to "Learning Values," the way television (and other mass media) are controlled and used today--which is simply to sell products--means that the content of American television programs is intended only to maintain and enforce the values of the large corporations which support the shows through commercials. Hence the programming itself can seldom be educational, relevant, realistic, or otherwise thought-inducing. Hence, from this perspective as well, television can be said actually to rot the brain.

James Dator, Professor in the Department of Political Science, University of Hawaii, Manoa, essentially agreed with Cirino's position, but took strong exception to that of Professor Volkart, arguing instead that if students were given adequate instruction in how television (and other media) programs are made, and were given reasonable access to the modes of media production, then people would be less likely to be so easily victimized by the minority of persons in our society who are skilled in these communication techniques and possess access to their production facilities.

In the lively discussion that followed, many in the audience (which included the head of the Audio Visual section of the Hawaii Department of Education, linguists, parents, students, librarians, and school, college, and university professors from many disciplines in the humanities and without) cited technical information about the present and emerging future of communication technologies and instruction in their use which was intended either to support or to refute one or the other of the positions taken by the presenters.

Is Print Passé?

Dennis Ellsworth, Professor of Greek and Latin at the University of Hawaii, Manoa, led off the discussion by showing how classical Greek culture had emerged prior to the development of writing, and how the introduction of literacy was both feared and welcomed in Greece. He further showed how literacy changed--arguably whether for good or for ill--the pre-literate classical society. From this analogy, he indicated how modern literate society is being changed by the widening use of post-literate communication technologies. He argued that this probably does not augur the death of print, but rather its movement away from dominance (a dominance attained not because it did everything it was called upon to do perfectly, but merely because it was at one time the best medium then available) and its restriction to those specific areas where it is clearly the most suitable of all other communication media (Ellsworth indicated that print is probably most suitable for labelling and indexing, but not necessarily the best and most accurate way to store knowledge, nor the exclusive means to transmit humanistic values.

James Mack, of the East-West Center's Culture Learning Institute, presented a forceful statement in favor of greater instruction in audio-visual communication in the Third World as well as the First on the basis that print was in fact becoming passé, and that successful communication in the modern world required "literacy" in non-print-based communication modes.

John Southworth, co-head of the EDUCOM project of the University of Hawaii, Manoa, described the PLATO interactive computer system briefly, and revealed that reading and typing abilities were necessary for one effectively to use this system. Thus, while the paperbased book may be diminishing in dominance (as computer and similar technologies rise), print will still be extremely important, both in the labelling and cataloging areas identified by Ellsworth earlier, and for simple messaging and receiving of detailed information. Nonetheless, at the same time, PLATO and similar (and emerging) systems go well beyond reading and writing in both input and output displays, clearly indicating the need for audio-visual instruction as well.

Henry Kariel, Professor of Political Science at the University of Hawaii, Manoa, warned very strongly that, because of the continued dominance of print in the foreseeable future, to reduce instruction in the basics of reading and writing would mean not to liberate persons from oppression, but rather to oppress them further still because then an even smaller elite of persons who could manipulate written words effectively could--and certainly would--dominate the illiterate majority.

Joseph Murray, Hawaii Sales Representative for Prentice-Hall Publishing Company, gave a very impassioned pleas for print, citing figures which show that book writing and purchasing is up, and that print certainly predominates presently, and will, in his opinion into the foreseeable future.

As testified by both the humanity scholar's previously-submitted written evaluation, and by the written evaluations of those participants who turned them in, the ensuing discussion generated much enthusiastic and hotly-argued participation concerning the points raised by the Presenters. The ideas advanced by Dennis Ellsworth concerning the impact of the introduction of writing into Greek society were especially conducive to discussion. Jim Dator, for example, cited extensively from a study undertaken by Elizabeth Eisenstein (a historian from The American University) on the impact of the printing press on Medieval Europe as an additional situation possibly analogous to the impact of electronic communication technologies in our own, and future, time.

Is Reading an Unnatural Act?

Professor Dator led off the discussion in this workshop by mentioning some possible meanings of "unnatural" in the topic-question, and then presented some fragmentary evidence as to why reading (as clearly distinguished from both speaking and writing) does seem to create a special problem for many people. He marshalled some studies which seem to indicate that brain hemisphere specialization, and the particularly taxing hemispherical cooperation which reading (especially the reading of Romanized script) requires, might be the reason for some reading difficulties. (Dator, on the other hand, also cited evidence questioning the frequent assertion that young peoples' reading ability has decreased in the United States in recent years. One extensive analysis of many different standardized reading tests over the past forty years ended with the statement: "We are convinced that anyone who says he knows that literacy is ignoring the data, such a person is at best unscholarly, and at worst dishonest." (Journal of Reading, March 1976, p. 463)

Four other scholars then presented technical information about reading and learning. Edith Kleinjans of the Hawaii English Project pointed out that reading was no more "unnatural" than most other things humans do, and that it is by far more "humanizing" than most activities. She gave many examples of the very positive effect learning to read has had on the lives of youngsters who were late in learning that skill. Her statement strongly reinforced the notion that reading is central to the learning and humanizing process.

Dorothy Craven of the Speech Pathology and Audiology program of the University of Hawaii, Manoa, reiterated some of the same data concerning reading problems that Dator had given (including

the positive mention of the book, Language by Ear and by Eye, which Dator had recommended in advance publicity for the workshop) and then went on to discuss other physiologically-related problems of reading acquisition.

Hiroki Kato, Professor of Japanese in the East Asian Languages Department of the University of Hawaii, presented highly controversial data about the relative ease of reading and writing of Japanese Kanji and English (Romanized) script. His conclusions were: (1) though it is harder to learn how to write Japanese than English, it is much easier to read Japanese than English; and (2) Japanese can be read faster and passages read in Japanese retained in memory longer than are those read in English. He attributed these factors to the more holistic, pictorial and etymological characteristic of Japanese Kanji in comparison with the analytical, linear characteristic of Romanized scripts. (Similarly, Dator had earlier cited studies that showed that certain types of dyslexia prevent Japanese from reading the syllabic version of their language--which is like English in the respect Professor Kato is discussing--but does not interfere with their ability to read Kanji.)

Joan Buehring of Videololo discussed her experiences working for the Hawaii State Department of Education during which time she visited many schools in the State, offering introductory instruction in the operation of video portapaking to elementary and secondary students. She concluded not only the students loved this form of communication and were able to acquire some sophistication in it rapidly, but also that the ability to communicate through portapax led many of them to communication and were able to acquire some sophistication in it rapidly, but also that the ability to communicate through portapax led many of them to seek to improve their ability in reading and writing as well. Thus, far from being opposed to reading and writing, portapaking appears to be highly conducive to it (several persons spoke in support of her position during the discussion period, and offered other examples of situations where this mutually supporting function had been discovered. Instruction in conventional literacy and media literacy should not be placed in opposition, it was argued. They should be listed together in our schools, in a more balanced way than they are at present.)

The last speaker was actually a videotape, prepared by John Southworth, of instruction in sign language for the deaf, which is made possible through the PLATO computer system at the University of Hawaii.

Not as much time was left for group discussion in this workshop as in the others because of the larger number of speakers, but the discussion proved to be very animated. For example, Professor Leon Edel (of the Department of English, University of Hawaii, Manoa), who had been invited to present his views to the first workshop

("Does Television Rot the Brain?"), took the opportunity of this third workshop to speak out, not on the topic of reading, but rather to deliver a strong attack on television as a disorienting and destructive factor in modern life. Edel insisted that in contrast, print, even in magazines, tends rather to be an integrating and positive influence, which is under perhaps mortal attack by television and its trivializing lackies within the educational system, as well as without.

Of all the presentations, probably that by Professor Kato provoked the greatest discussion, pro and con, with many linguists and persons familiar with Japanese (or other ideographic writing systems) taking both sides of the position he put forth.

How Do You Ask a Venusian to Dance?

This workshop sought to expand the discussion of "literacy" beyond a mere confrontation between print and audio-visual media to include other present or emerging communication possibilities open to humans and others.

After a greeting and introduction by Dick Barber of the Social Science Research Institute of the University of Hawaii, Manoa, the session opened with a series of dance episodes presented by Carl Wolz, Professor of Dance at the University of Hawaii, Manoa, and his graduate class in dance. The group first handed out a sheet of paper to each person attending upon which eight words were written. The group then danced eight dances, and the audience indicated which word had been communicated by which dance. Results compiled later by Professor Wolz indicated that the "communication" was extremely good: most people correctly matched all eight dances with the appropriate words.

Two persons presented ideas about music as communication: Peter Corragic and Neil McKay, both professors on the Department of Music at the University of Hawaii, Manoa. Corragio spoke especially about current and projected developments in the production of computer and other electronic music, while Neil McKay discussed how a composer of conventional music "thinks" and seeks to communicate with his audience.

Milton Diamond, Professor of Anatomy and Reproduction, gave one of the most interesting and amusing talks in all four workshops. Taking quite literally the question, "How Do You Ask A Venusian To Dance?", Professor Diamond reviewed the attitude of NASA towards the representation and indication of human sexuality in messages sent from Earth to deep space, and speculated on problems of sexual intercourse between humans and other space beings. He then discussed, more soberly, the advantages and disadvantages of sexual intercourse as a mode of human communication--especially one which might be taught in the schools.

Patrick Takahashi, Professor in the School of Engineering, at the University of Hawaii, Manoa, presented a slide show on current research into the discovery of and communication with extra-terrestrial intelligence, including work he had undertaken recently with a NASA research group.

The final speaker was Betsy Christian, local coordinator of the World Future Society and active member of the Hawaii Health Net. She spoke on Extra-Sensory Perception and other forms of "paranormal" communication. Basing her speech heavily on well-documented (though obviously still controversial) experiences of such communication, she enjoined the group to expand its understanding of communication--and its instruction of communication techniques--to include all of the topics discussed at the Workshop, especially in the more novel area of the paranormal. She stated that she believed such an expansion would help us to tap much in the human potential that presently lies hidden behind our current narrow communication limitations.

Though almost all of the allotted time for the workshop was taken up by the presentations outlined above, many persons stayed on to discuss the statements, and to inquire how--if at all--these perceptions could be included in formal educational curricula.

The Mediacy Fairs

Two types of technical information were given at the Mediacy Fairs which were held on Oahu on November 25 and 26, and on Maui on November 27. On the one hand, there were interactive booths and displays set up where persons attending the Fairs could receive hands-on experience in the use of certain types of communication technologies, such as the PLATO computer system; the Jacquard Word Processing System; a variety of sound synthesizing techniques presented by Audiessy; basic instruction in portapaking by the Health Instructional Resources Unit of the University of Hawaii, Manoa, Medical School; and a very popular contest between print-based and video-produced communication devised by Video Access. In addition there was book display set up by the University of Hawaii Press, and video tapes specifically on the topic of media literacy (such as "A Requiem for Literacy?" by TV Ontario, an explanation of how the Mediacy Fair television public service advertisement was made by Sensorium, as well as excerpts from the series "Media Circus" produced by TV Ontario which featured interviews with Marshall McLuhan and others). Norman Geschwind showed a series of recently produced films dealing with energy and environment as well.

In addition to these activities, three featured guests (Simon Nicholson of the Open University in England, Armando Robles Godoy, novelist, poet, and filmmaker from Peru, and Larry Gross from the Annenberg School of Communication, University of Pennsylvania) presented public lectures on various aspects of the topic.

Nicholson described the operation of the Open University--a school totally without a campus but with the largest enrollment in the United Kingdom--which relies entirely on radio, mail, telephone, television, and tutorial techniques of instruction and evaluation. Nicholson also presented and discussed a film which he and Jim Dator had made as a part of his Art and Environment Course entitled "Whatever Will Be..."

Armando Robles Godoy gave an especially compelling lecture on media literacy, the central highlight of which was an eleven minute film, entirely without dialogue, entitled "The Cemetery of the Elephants," which he wrote and directed. Armando Robles Godoy emphasized two points repeatedly: (1) film has grammar all its own which is distinct from but as basic as that of spoken or written language. Unless film grammar is understood--unless it is taught and practiced--we remain wholly illiterate and subject to the manipulation of those effective filmmakers who understand a language we do not, but to which we are overwhelmingly subject. (2) Effective instruction in media literacy is necessary not only in advanced parts of the world, such as the United States, but also in Third World areas such as Peru and other parts of South America, where only a tiny minority of the population can read and write, while almost all people watch television, listen to the radio, and go to the movies. Media illiteracy is a much more serious problem than conventional illiteracy in such a situation, Robles Godoy argued, and it is absolutely essential that educators respond to these realities.

Larry Gross gave a scholarly, historically and empirically-based lecture on the separation of "art" from life in the modern world; the assumption of film and television as a major producer of "art" in a popular sense (even though only a tiny proportion of persons are able to practice this art, almost all modern persons watch it and are influenced by it); and belief that the content of television is almost wholly misleading and falsifying of reality, even though it seems to represent things "as they really are."

The Mediacy Fair on Maui capsuled the essence of the four Oahu workshops and the two-day Mediacy Fair into a single day's presentation. In the morning, there were two workshops. The first, titled "Is Print Passé?/Is Reading an Unnatural Act?" began with Jim Dator introducing and subsequently discussing a video tape of the TV Ontario film, "A Requiem for Literacy?". Simon Nicholson then described the purpose and work of the Open University in England as an example of a school that relies entirely upon mediated educational techniques, stressing both the strengths and weaknesses of that approach. Marian Blanton, Chairperson of Language Arts, Maui Community College, followed with a very strong defense of print-based education in contrast to media-based attempts.

These three different approaches to the topic of the workshop generated a great amount of discussion, in which Dennis Ellsworth (Classics, UHM) and Donald Topping (Linguistics, UHM), pressed Professor Blanton carefully on her assumptions about the primacy of print. Many in the audience came both to her defense, and to that of those expressing views contrary to her.

The second morning seminar was entitled, "The Native Hawaiian Traditions: Visual, Oral, and Written Transmission Through Language, Chant, Songs, and Dances". Two well-known experts of the Hawaiian

Tradition, Rubellite Johnson of the University of Hawaii, Manoa, and Kalani Meinecke of the University of Hawaii, Hilo, presented very interesting and engaging speeches on the history and development of Hawaiian culture, in relation to the media used to express it. They concluded that, though different media resulted in different modes of expression, the core of the culture being transmitted was not irrevocably damaged by expression in different media. Even the revolutionary move from an oral to a print-based society did not destroy the essential characteristics of Hawaiian culture, though it undoubtedly modified them to some extent. This position was debated at length in the discussion period that followed the speeches.

In the afternoon, there were two more workshops. The first, led by Robert Cirino, Instructor in English at the University of Hawaii, Manoa, and author of many books on the mass media, more recently, You Are Being More Than Entertained, emphasized the political and ideological content of present American television, and called for citizens to demand greater control over that programming. This workshop, entitled "Does TV Rot The Brain?" covered much of the same ground in Maui that the similarly-named workshop in Honolulu discussed.

Immediately thereafter, Armando Robles Godoy, the Peruvian novelist and filmmaker, gave summary analysis of media illiteracy in relationship to modern film production and distribution. He then introduced his film, The Green Wall, which was shown in its entirety. Robles Godoy then led a discussion of the film, including both the humanistic values portrayed in it and the techniques used to communicate them. Bob Green, film critic for the Maui Sun, served as facilitator of this workshop.

In the evening there was an additional set of presentations, featuring several slide shows on visual literacy by Robert Gilman, Tim Lydgate, Karen Turnbull and Mary Walsh.

Summary

In the Media Literacy Project, we discussed not only the desirability of making fundamental changes in our basic educational curricula and the communication skills underlying all knowledge, but also the question of whether print-based knowledge is sufficient to continue to be the basic foundation of education that it presently is.

Since much knowledge has been traditionally transmitted through print, this is a serious question for the humanities indeed. In fact, the basic question being asked in the project turned out to be, "to the extent that the humanities are based on print communication while the role of non-print communication technologies in contemporary life grows apace, what will happen to humanities in modern society, and how should the humanities respond to this challenge?" More specifically,

- Are there fundamental humanistic values which cannot be transmitted via non-print media? Is "educational" television impossible? Is audio-visual education a fraud or a diversion?

- Are computers, pocket calculators, holography and the like rendering printing obsolete--or giving print renewed, if altered, importance?

- Why is it almost impossible to prevent children from learning to speak, but so difficult to teach them to read? Are "reading disorders" a sign of a healthy brain? Why is it so easy to teach children to use a Portapak effectively, but so difficult to teach them to write "good English"?

- Is extraterrestrial--and non-human terrestrial--communication likely--or a harmful fantasy? Can you say it with flowers? What can--and can't--you communicate through music and dance?

- Have traditional Hawaiian values been preserved or destroyed by the introduction of Western-derived writing systems.

In summary, to the extent that a fundamental humanistic value is the democratic principle of equal access to culture and equal oportunity to communicate one's knowledge, feelings and desires, how should persons concerned with the humanities react to growing dominance of the newer, non-print media? Indeed, should persons in the humanities even more actively defend only print literacy, or should they seek to make humanistic values accessible through other modes of literacy as well? Or, conversely, is it the nature of the newer media to destroy, trivialize, or contradict the essence of humanistic values? In short, what are the values that should guide public policy concerning the use of the newer media in the educational system of Hawaii?

COMMUNICATIONS: HAWAII'S NEW HORIZON

David L. Jones and others

In recent years the State Department of Planning and Economic Development has increased its attention to a very difficult subject: the limits to which Hawaii can grow. Outside constraints such as energy supplies, and internal constraints such as water supplies, have helped to bring about this concern for Hawaii's long-range future. Such attention might be called "worry work" because it requires planning and action to forestall anticipated difficulties for future generations in Hawaii.

There is another category of Departmental work, however, which is more satisfying: the task of assessing new potentials for Hawaii's future. Communications technology is an excellent example. The potential of available and anticipated communications techniques and equipment is increasing with extraordinary rapidity, while costs have been declining significantly, and both trends give promise of continuing.

Many of those closest to the "communications era" changes argue that these new technologies will have an impact on our society as great as the industrial revolution had two centuries ago. For example, U.S. Representative Lionel Van Deerlin of California advanced this view when he announced recently a lengthy series of hearings on proposed reforms of the Federal Communications Act.

Our perception of Hawaii's geographical situation has not yet caught up with the realities of the communications revolution: communication as it is between New York and Chicago. The relevance of distance as a cost factor for spoken messages and data transmission is declining with enormous speed. Indeed, there is considerable evidence that people and institutions in Hawaii are not keeping up with the implications of this shift; this is most obviously true in terms of the tradeoffs between transportation and communications. The potential in this area is shown by the fact that Dow Chemical is said to have saved $200,000 in travel and hotel bills in one year by using video meetings at $2,000 an hour instead of physical meetings.

But there is a reality for the Hawaiian Islands themselves that also needs to be considered. It seems possible that many problems developing because of population concentration on Oahu could be controlled, and possibly even eliminated, through good communication and computer networks between the Islands. While it probably will remain impracticable for many people to commute between the Islands, the prospects of "telecommuting" seem promising (telecommuting is a new word suggesting the possibility of many people working out of their homes). Indeed, an increasing number of authorities see this

as one of the dominant future life-styles and predict the possibility of a significant number of people living in Hawaii and "working" in mainland cities as early as 1985.

There is one other factor which must be taken into account: people will accept ideas from others only if trust exists between the sender and the receiver. When cynicism takes the place of trust, information tends to be perceived, not in terms of the message being sent, but rather through a thick screen reflecting fear of manipulation. It is therefore crucial to maintain the "Aloha spirit" if Hawaii is to benefit fully from the communications revolution. Economic and social policies must be grounded on mutual concern and respect of people for each other despite differences of background and heritage.

The objectives of the Communications Policy and Planning Committee, whose contributions form this report, were to assess the need for advanced communications technology in Hawaii in a number of areas, and to compile a tentative inventory of available communications tools and techniques for meeting those needs. Related factors were also considered, such as energy use and conservation, the environment, and stated goals, objectives, and policies of the State as documented in the Hawaii State Plan, the Governor's State of the State addresses, and other policy documents.

An all-volunteer committee was assembled, consisting of persons knowledgeable in various aspects of the community and who have demonstrated an active interest in, or knowledge of, communications, whether from a technical or a philosophical viewpoint. The committee, jointly chaired by David L. Jones and Henry L. Wong of DPED, consisted of the following members:

Karen L. Ah Mai, University of Hawaii Center for Futures Study
Barbara K. Bird, University of Hawaii College of Tropical Agriculture
Raleigh Ferdun, Senior Planner, Hawaiian Telephone Company
Victor M. Goto, Planning Director, Hawaiian Telephone Company
Bernard D. Hill, Vice President, Hawaiian Telephone Company
David L. Jones, Special Projects Administrator, Department of Planning and Economic Development
Carl O. Nagami, Engineering Computer Services, Department of Transportation
Dennis S. Niimi, Technical Planning Manager, Hawaiian Telephone Company
W. H. Stryker, The Dillingham Corporation
Henry L. Wong, Special Projects Administrator, Department of Planning and Economic Development

The proposed action plan followed by the committee had been drawn up as a co-operative effort of Jones, Wong, Hill, Goto, Ferdun, and Niimi. It proposed the following steps:

- Assemble a list of State objectives or strategies which would seem to be communications oriented.

- Assign these to subcommittees for more intensive study.

- Subcommittees will identify the impact which current and probable future communications tools or techniques are likely to have on the success of each objective or industry.

- The committee will discuss the results of the subcommittee findings and organize them into a committee report.

Ultimately the original list of strategies was consolidated into a number of broader headings containing those which were logically related, or those of which a member had knowledge or available sources of information.

The intent of the Committee on Communications Planning and Policy, and the primary purpose of this report, is to demonstrate the need for communications planning, to examine a few of the many issues involved, and to draw tentative conclusions concerning communications technologies and how they are likely to affect some major State objectives and strategies. We believe that we have accomplished this. Obviously it was not possible to make thorough studies of each subject area in the time available, but this was not the Committee's purpose. One of our major recommendations is to carry on the work begun with this Committee on a more formal and sustained basis.

The Department of Planning and Economic Development engaged the services of a consultant, Robert Theobald, the well-known writer, lecturer, futurist, and socio-economist who sees the industrial era rapidly being supplanted by a communications era. Mr. Theobald has given generously of his time and interest far beyond the expectations of the contract.

Each of the individual reports submitted suggests directions for communications planning.

Robert Theobald and J. M. Scott prepared a scenario in the form of a report of a computer news service dated January 1, 1984; it visualizes a few possibilities for the future, including Hawaii's potential as a communications center.

Carl Nagami and his subcommittee looked at the use of telecommunications technology as a partial substitute for transportation, showing how such a plan would conserve energy, reduce air pollution, and could eventually reduce the necessity for large centralized office buildings and parking structures. They also produced a short scenario dealing with a typical day in the life of a "non-commuter."

Karen Ah Mai, who is familiar with many aspects of communications through her association with the University's Social Science Research Institute, points out in her two reports problem areas in need of further study in connection with Hawaii's role as an international center, marketing center, and communications center, and in government operations and the distribution of public services.

Henry Wong's report shows that the motion picture and television industries are heavily dependent on many communications technologies. Indeed, television itself is a communications technology, and of course makes use of a number of others as well.

W. H. Stryker's report on the visitor industry suggests additional categories of suppliers of communications services to be surveyed, and additional contacts which should be made in communications planning. The section also mentions the formation of a Telecommunications Committee of the Hawaii Hotel Association, which offers possibilities for working with the recommended Advisory Committee and others toward policy formulation for communications in the visitor industry.

Although Barbard Bird's report concludes that agricultural production is "not seen as telecommunications dependent to any significant degree," it also points out that Hawaii's potential for agricultural research and education is considerably greater than that for actual farm production. Thus communication is expected to be a significant factor in Hawaii's future involvement with agriculture and aquaculture in the dissemination of data, if the research and educational aspects are to be emphasized.

Perhaps the most obvious conclusion is that much more remains to be done. The efforts of this Committee achieved the intended purpose of breaking ground and demonstrating ways of examining communications technology and issues in the light of State objectives and important industries of Hawaii, but it is only a beginning.

The subject of communications is one which concerns every phase of life, from face-to-face conversation to international diplomacy. Yet its very omnipresence causes it to be taken for granted and all too often overlooked as an important factor in planning. It is always important, and often critical, that the receiver of communication understand the message the sender intended. And as barriers between countries and continents become ever smaller with air travel and advanced communications technology, it is increasingly vital that conditions be optimized for clear communications.

The Committee is in agreement that the technology of communications is not generally a limiting factor; technology remains considerably in advance of sociological and political developments. The time has come when communications must be recognized as a significant factor in the State's planning process, and this report is a tentative step in that direction.

The following recommendations to the State Director of Planning and Economic Development include those specifically mentioned in individual reports and others which seem appropriate from discussions with Committee members and with others in the communications field. A few have been adapted from a set of recommendations made by Dallas C. Williams of Computer Resources Group, and used with his permission. They are listed approximately in order of priority, with the recognition that this entails considerable subjective judgment.

1. It is recommended that the Department of Planning and Economic Development, as the State's primary planning agency, and in the light of its statutory mandate to "encourage initiative and creative thinking" (201-2, HRS), initiate a more formal planning effort for the more effective use of communications technologies in government management, and in the pursuit of the State's wider goals of economic and social benefits for its citizens.

2. It is recommended that an Advisory Committee on Communications be established, to consist of representatives from appropriate government agencies, private industry, citizen groups, and the academic community, to advise the Director of Planning and Economic Development on communications issues, policies, and resources.

3. It is recommended that a study be made of costs versus benefits of current and anticipated communications technologies useful to State government or for other applications related to the State planning process. Other State agencies especially concerned with communications should participate in the study. Suppliers of telecommunications equipment and services also should be surveyed.

4. It is recommended that the Advisory Committee on Communications assist the DPED with the communications aspects of the Department's Management Information System project, and it is further recommended that the State MIS include a communications data base.

5. In consideration of the growing trend toward computerized data banks in credit, banking, government, and similar areas, it is recommended that the relatively new concept of the right to communicate, including the right of access to information, the right of the citizen to participate in government decision-making, the right to privacy, and others, be carefully studied to ensure that policies provide proper safeguards.

6. To deal with the relationships of communications to energy conservation, traffic problems, the environment, population dispersion, and efficiency in government, it is recommended that studies completed and under way involving telecommunications as a substitute for transportation be monitored and analyzed in terms of Hawaii's needs and conditions, and that policies be established to encourage pilot projects in the Islands, since Hawaii has characteristics well suited to such experiments.

7. It is recommended that greater citizen involvement in State and County decision-making be promoted as two-way communications essential to good government, by improving and expanding the use of communications technology for this purpose.

The Committee feels that its members have benefited considerably by meeting and discussing communications issues. Its tentative findings and recommendations are presented here for your consideration, and your comments and suggestions are solicited.